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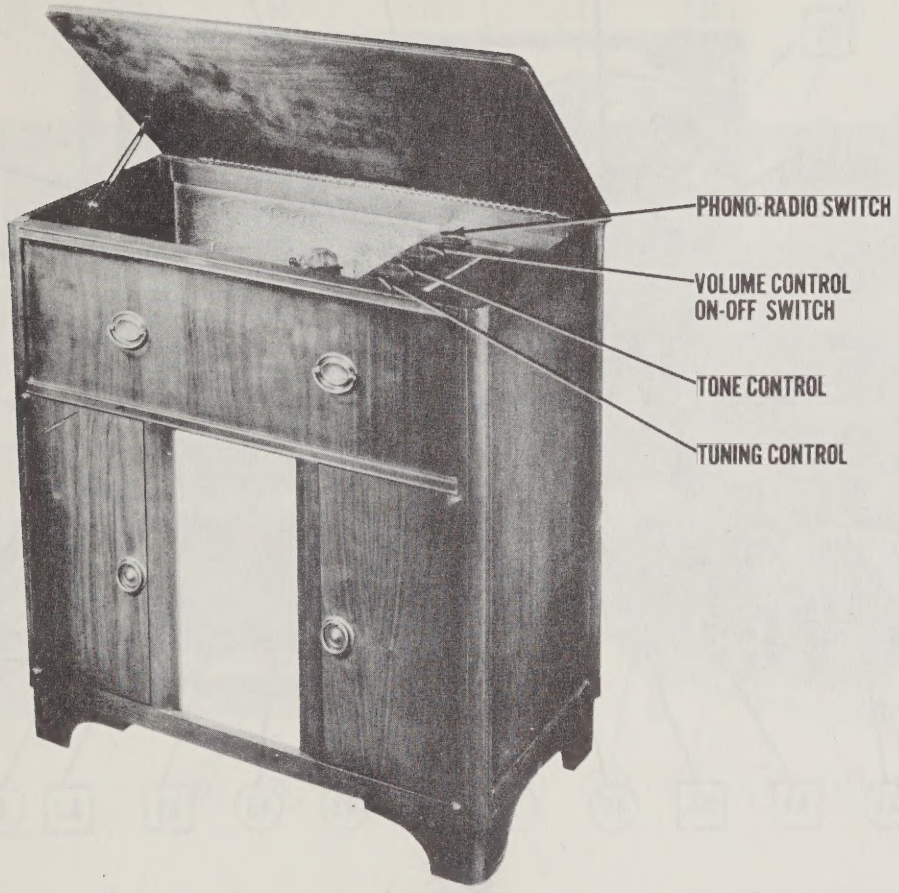

AIRCASTLE
MODEL 572

AIRCASTLE
MODEL 572

AIRCASTLE MODEL 572

TRADE NAME	Aircastle, Model 572
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago, Ill.
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (SEVEN)	Types, 6SA7GT Converter, 6SF7 IF Amp.-Det.-AVC, 6SL7GT AF-Phase Inv., (2) 25L6GT Power Output, (2) 25Z6GT Rectifier.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1700KC RATING .5 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	200 MMFD	High side to ext. ant. lug. Low side to chassis.	1700KC	"	"	A5	Adjust for maximum output.
3	200 MMFD	"	1500KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter		6SA7GT	8AD	
2	IF Amp.-Det.-AVC		6SF7	7AZ	
3	AF-Phase Inv.		6SL7GT	8BD	
4	Power Output		25L6GT	7AC	
5	" "		25L6GT	7AC	
6	Rectifier		25Z6GT	7Q	
7	"		25Z6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
8A	40	150		PRS150-40-40	EDL4415	DSB-2x40-150	TA-440	Filter-Blue
B	40	150						" -Red
C	40	150		PRSA150-20-40	EDL4215	DSB-2x40-150	TA-240	" -Yellow
D	10	150						" -Green
9	.02	400		484-02	GT4S2	ST-4-02	TC-12	Audio Coupling
10	.02	400		484-02	GT4S2	ST-4-02	TC-12	" "
11	.02	400		484-02	GT4S2	ST-4-02	TC-12	" "
12	.2	200		484-2	GT4P2	ST-4-2	TC-2	Phono Isolation
13	.002	600		684-001	GT6D2	ST-6-002	TC-22	Tone Compensation
14	.2	200		484-.2	GT4P2	ST-4-2	TC-2	RF Bypass Pwr. Supply
15	.05	200		484-05	GT4S5	ST-4-05	TC-15	AVC Filter
16	.2	200		484-.2	GT4P2	ST-4-2	TC-2	Line Isolation
17	.001	600		684-001	GT6D1	ST-6-001	TC-21	Ant. Isolation
18	220	500		1468-0002	5W5T2	MO.5-32	1FM-32	AF Plate Bypass
19	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	Diode Filter
20	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	" "
21	22	500		1468-000025	5W5Q25	MO.5-425	MS-42	Osc. Grid Cap.
51	.05	200		484-05	GT4S5	ST-4-05	TC-15	Line Filter

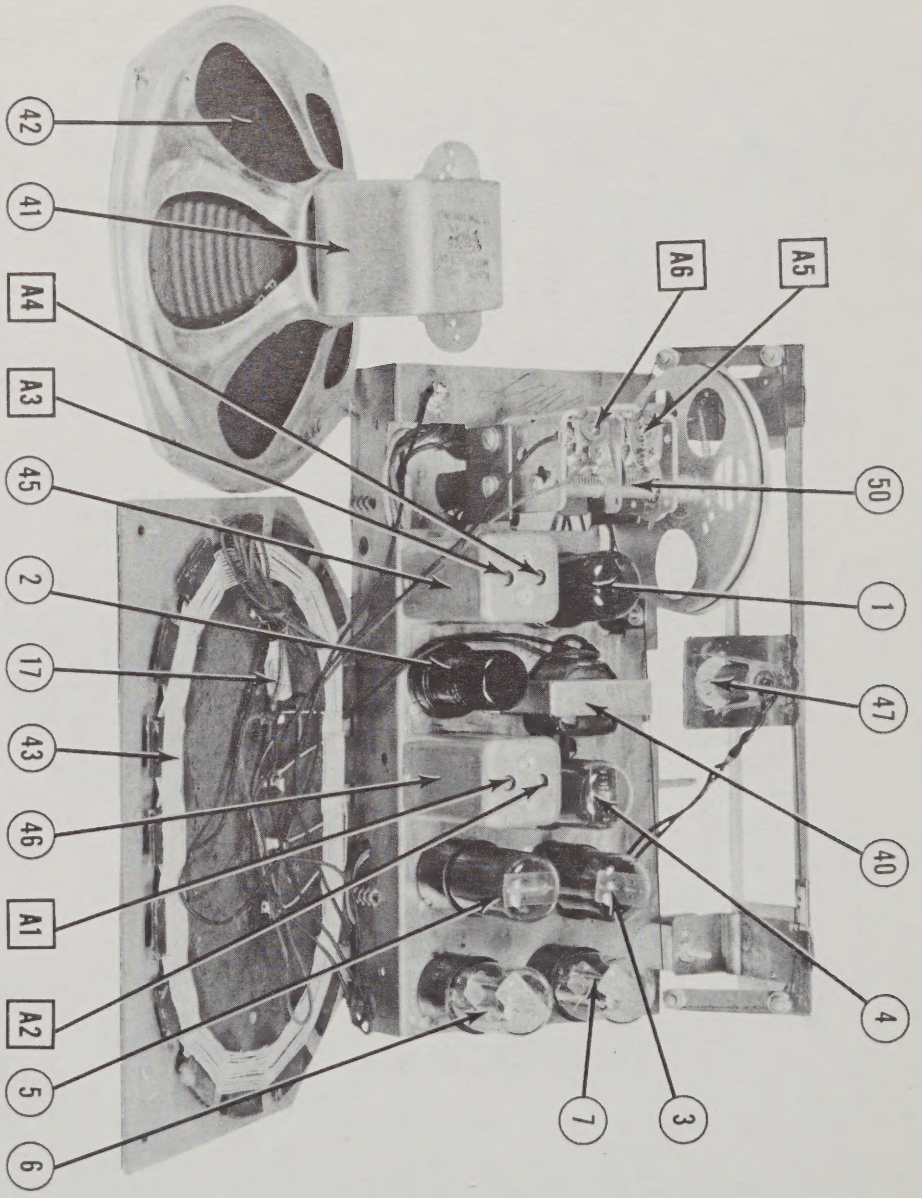
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	500KΩ	½		D13-133	M-60-Z	Volume Control
B	Shaft			A	Not Req.	Attach to 22A per instructions
C	Switch			41	SW-A	" " " " "
23A	500KΩ	½		D13-133	M-60-Z	Tone Control
B	Shaft			A	Not Req.	Attach to 23A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
24	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
25	220KΩ	½		BTS-220K	Red-Red-Yl. Line Isolation
26	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
27	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Diode RF Filter
28	33Ω	½		BW-½-33	Or.-Or.-Blk. Feedback
29	100Ω	½		BW-½-100	Br.-Blk.-Br. "
30	2200Ω	½		BTS-2200	Red-Red-Red AF Cathode
31	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Grid
32	100KΩ	½		BTS-100K	Br.-Blk.-Yl. AF Plate Load
33	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inverter Plate Load
34	18KΩ	½		BTS-18K	Br.-Gray-Or. Phase Inverter Grid
35	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
36	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "
37	82Ω	1		BW-1-82	Gray-Red-Blk. Output Cathode
38	1500Ω	½		BTS-1500	Br.-Grn.-Red Filter
39	1500Ω	1		BTA-1500	Br.-Grn.-Red "

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
40	5200Ω CT	3.3Ω	250Ω CT	.8Ω		A-3852	T22S58*	A-2901	*Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD RES.	VC IMP.		ST-117		
41	PM	3.3Ω		Mod. P8-T	8A31	
	CONE DIA.	VC DIA.				
42	7-3/8"	1"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
43	Loop Ant.	.2Ω	1Ω			
44	Osc. Coil		9Ω		14-1060	
45	Input IF	14Ω	14Ω	SLR-127	16-6658	
46	Output IF	9Ω	9Ω	SLR-128		

DIAL LIGHT

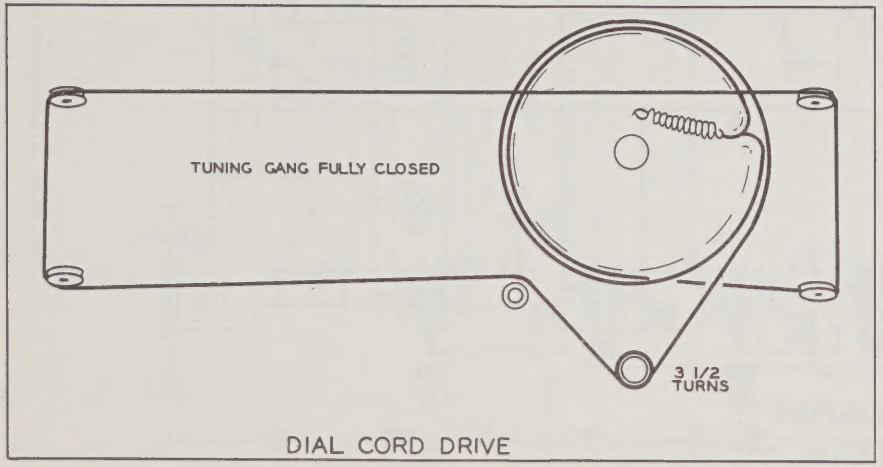
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					AIRCASTLE PART No.		
47	Screw	120 V.					3 Watt

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	AIRCASTLE PART No.	ASTATIC PART No.	
48		L-70A	L-70 Original Part

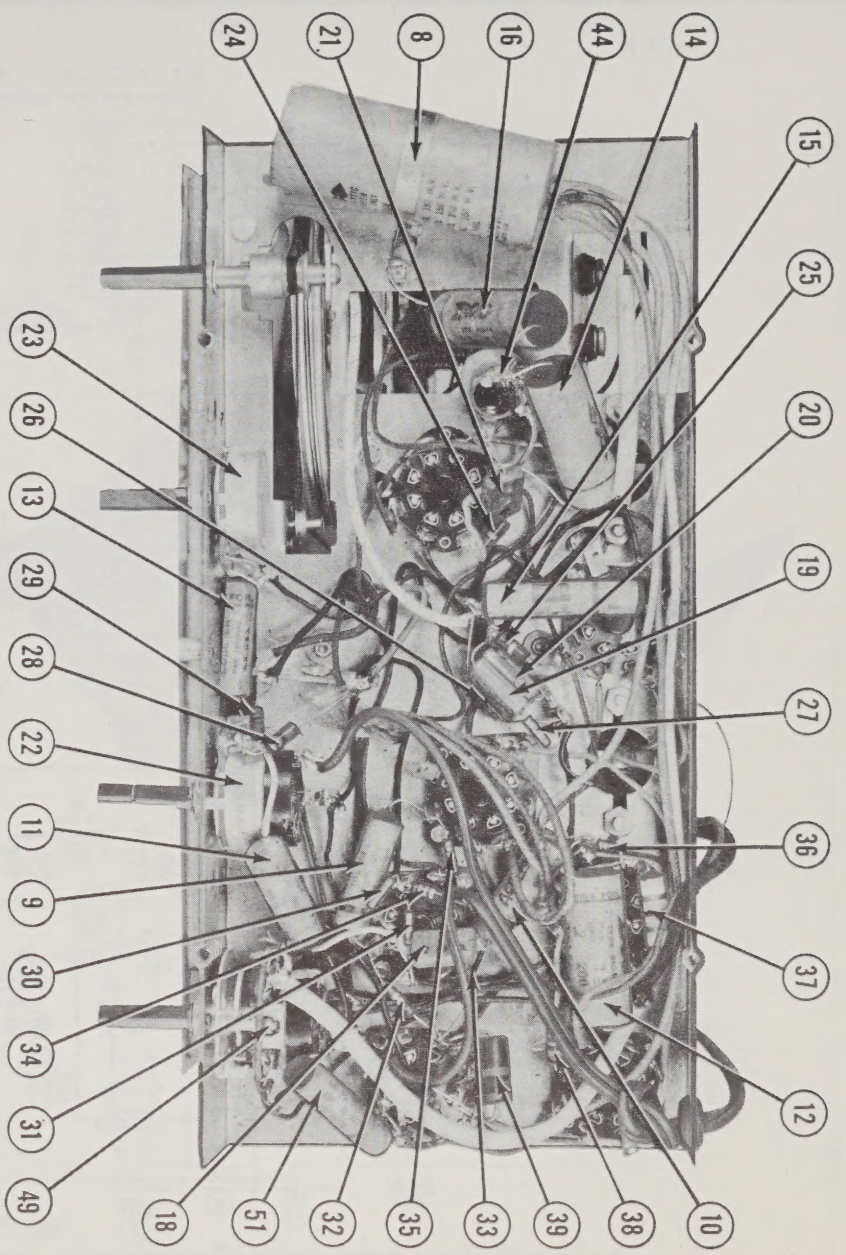
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
49	Switch		Radio-Phono
50	2 Gang Var. Cap		(28-463MMF, 36-199MMF)

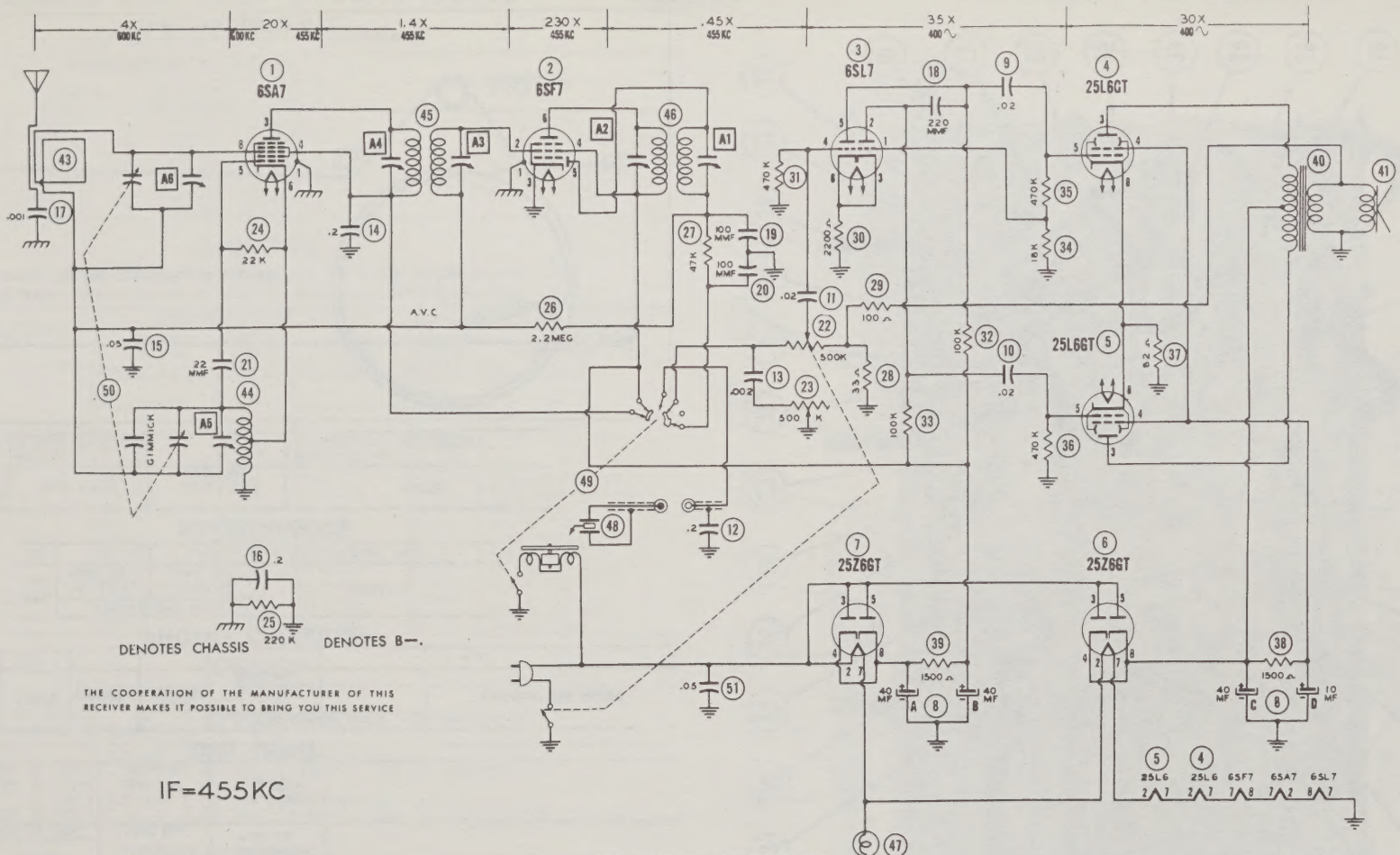


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



AIRCASTLE MODEL 572



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF=455KC

VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN WITH RADIO-PHONO SWITCH IN RADIO POSITION.

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0V.	6VAC	100VDC	100VDC	-14VDC§	0V.	11VAC	-.5VDC
2	6SF7	0V.	-.5VDC	0V.	100VDC	-.6VDC	100VDC	17VAC	11VAC
3	6SL6	0V.	77VDC	1VDC	0V.	72VDC	1VDC	0V.	6VAC
4	25L6	0V.	41VAC	122VDC	117VDC	0V.	0V.	17VAC	7.8VDC
5	25L6	0V.	66VAC	125VDC	117VDC	0V.	0V.	41VAC	7.8VDC
6	25Z6	0V.	89VAC	117VAC	124VDC	117VAC	0V.	66VAC	124VDC
7	25Z6	0V.	117VAC	117VAC	147VDC	117VAC	116VDC	89VAC	147VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	220KΩ	3Ω	100KΩ	100KΩ	22KΩ	1Ω	7Ω	2.8 Meg.
2	6SF7	220KΩ	2.8 Meg.	0Ω	100KΩ	550KΩ	100KΩ	10K	7Ω
3	6SL7	18KΩ	200KΩ	2.2KΩ	470KΩ	220KΩ	2.2KΩ	0Ω	3Ω
4	25L6	INF.	26Ω	100KΩ	100KΩ	400KΩ	INF.	10Ω	82Ω
5	25L6	INF.	41Ω	100KΩ	100KΩ	470KΩ	0Ω	26Ω	82Ω
6	25Z5	INF.	56Ω	75Ω	100KΩ	75Ω	INF.	41Ω	100KΩ
7	25Z5	INF.	75Ω	75Ω	100KΩ	75Ω	100KΩ	56Ω	100K.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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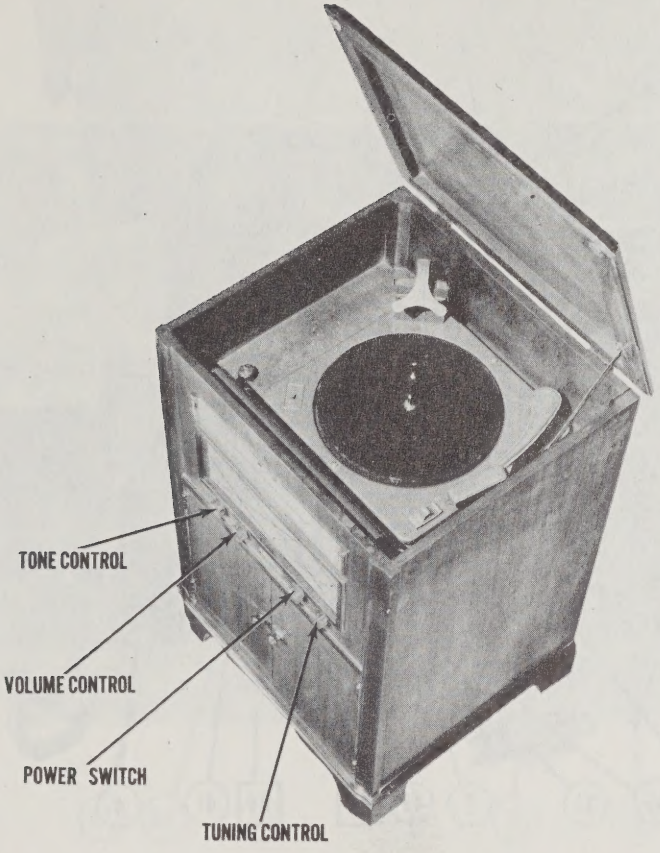
493-1

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRCASTLE
MODEL 127084



AIRCASTLE MODEL 127084

AIRCASTLE
MODEL 127084

TRADE NAME	Aircastle, Model 127084
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago, Ill.
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	535-1725KC RATING .33 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	250MMFD	"	1725KC	"	"	A5	Adjust for maximum output.
3		Loop	1500KC	Tune for maximum output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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DATE 2/49-#493-2 SET #55-FOLDER #2

PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 127084

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA -					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
5	40	150	A18-280	PRS150/40	BR4015	M-40-150	UT-401	Filter
6	40	150	A18-280	PRS150/40	BR4015	M-40-150	UT-401	"
7	.1	600	A16-160	684-.1	GT6P1	ST-6-1	TC-1	Line Filter
8	.005	600	A16-153	684-005	GT6D5	ST-6-005	TC-25	Output Plate Bypass
9	.02	400	A16-150	484-02	GT4S2	ST-4-02	TC-12	Audio Coupling
10	.002	600	A16-155	684-002	GT6D2	ST-6-002	TC-22	Tone Compensation
11	.1	200	A16-157	484-.1	GT2P1	ST-2-1	TC-1	AF Plate Decoupling
12	.01	400	A16-156	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
13	.05	200	A16-152	484-05	GT4S5	ST-4-05	TC-15	AVC Filter
14	.2	400	A16-154	484-.2	GT4P2	ST-4-2	72P3	Line Isolation
15	250	500	A15-176	1468-00025	5W5T25	MO.5-325	1FM-325	AF Plate Bypass
16	250	500	A15-176	1468-00025	5W5T25	MO.5-325	1FM-325	Diode RF Filter
17	50	500	A15-175	1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESIST-ANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	
18A	500KΩ	½	A24-169	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 18A per instructions
19A	2 Meg.	½	A26-123	D13-139	AM-83-S	Tone Control
B	Shaft		Not Req.	E	KSS-3	Attach to 19A per instructions

RESISTORS

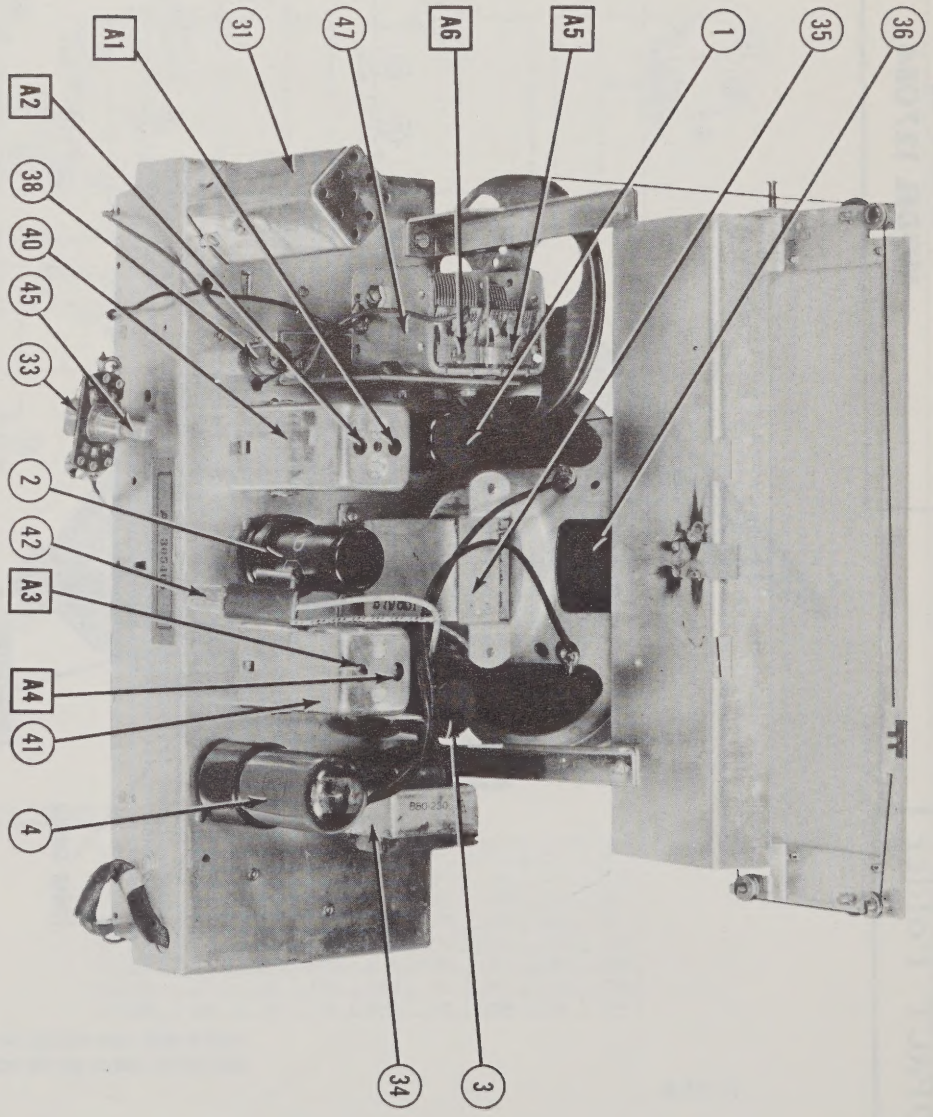
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	
20	22KΩ	½	A60-659	BTS-22K	Red-Red-Or. Oscillator Grid
21	15 Meg.	½	A60-664	BTS-15K	Br.-Grn.-Blue AVC Network
22	2.2 Meg.	½	A60-684	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
23	470KΩ	½	A60-662	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
24	220KΩ	½	A60-667	BTS-220K	Red-Red-Yl. AF Plate Load
25	4.7 Meg.	½	A60-669	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
26	470KΩ	½	A60-662	BTS-470K	Yl.-Vi.-Yl. Output Grid
27	110Ω	2	A60-702	BW-½-120	Br.-Red-Br. Output Cathode
28	12KΩ	2	A60-720	BT-2-12K	Br.-Red-Or. Cathode Dropping
29	27Ω	1	A60-721		Red-Vi.-Blk. Surge Limiter
30	1000Ω	1	A60-699	BTA-1000	Br.-Blk.-Red Filter
31	140Ω - 220Ω		A60-719		Filament String-See Note
32	470KΩ	½	A60-662	BTS-470K	Yl.-Vi.-Yl. Line Isolation
33	220KΩ	½	A60-667	BTS-220K	Red-Red-Yl. Series Phono

Note-This is a special compensating unit. Order from manufacturer.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
34	3000Ω	3.5Ω	300Ω	.8Ω	B-80-230	A-3876	T22S45	A-2928	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-108#		
35	PM	3.5Ω	B79-351	Mod. P6-X	6A15	#Trim flange
	CONE DIA.	VC DIA.				
36	6"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIRCASTLE PART No.	MEISSNER PART No.
37	Loop Ant.	.1Ω	.8Ω	C82-50	
38	Loop Loading		.2Ω	A10-503	
39	Osc. Coil	1Ω	6Ω	B10-411	14-1060
40	1st IF	40Ω	38Ω	B10-453	16-6658
41	2nd IF	39Ω	37Ω	B10-454	16-6660

DIAL LIGHT

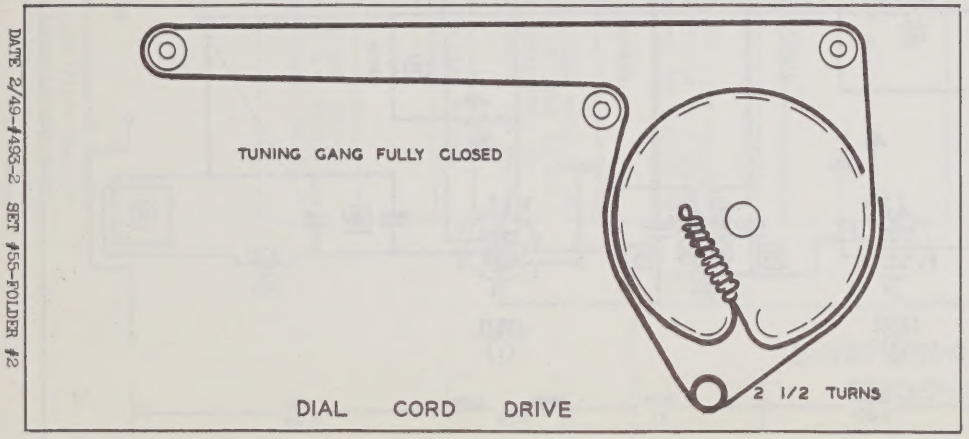
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: AIRCASTLE PART No.		INSTALLATION NOTES
42	Bayonet	6-8	0.15	Brown			Type 47

PHONO CARTRIDGE

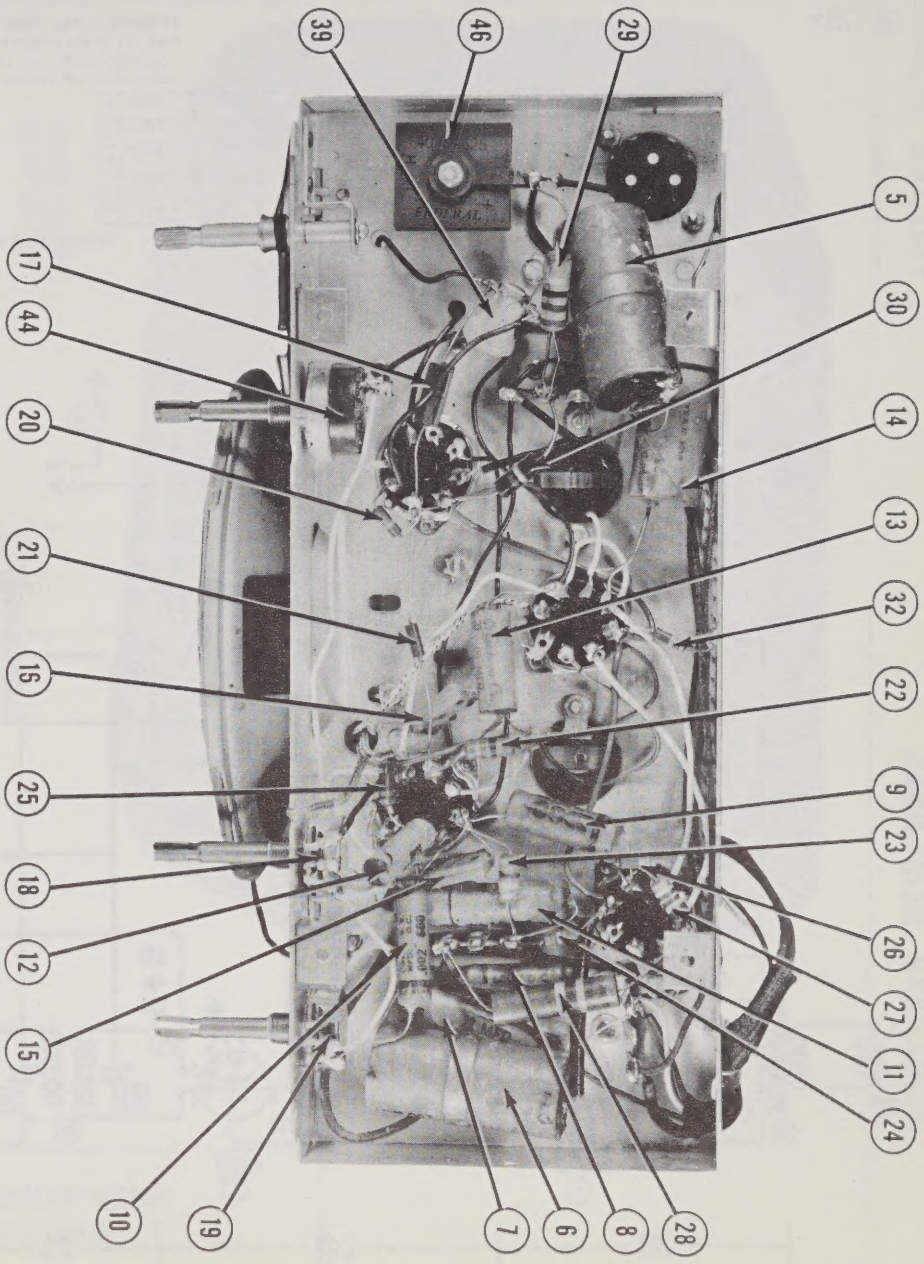
ITEM No.	REPLACEMENT DATA: AIRCASTLE PART No.	ASTATIC PART No.	REMARKS
43		L-70	L-70-Z Original Part

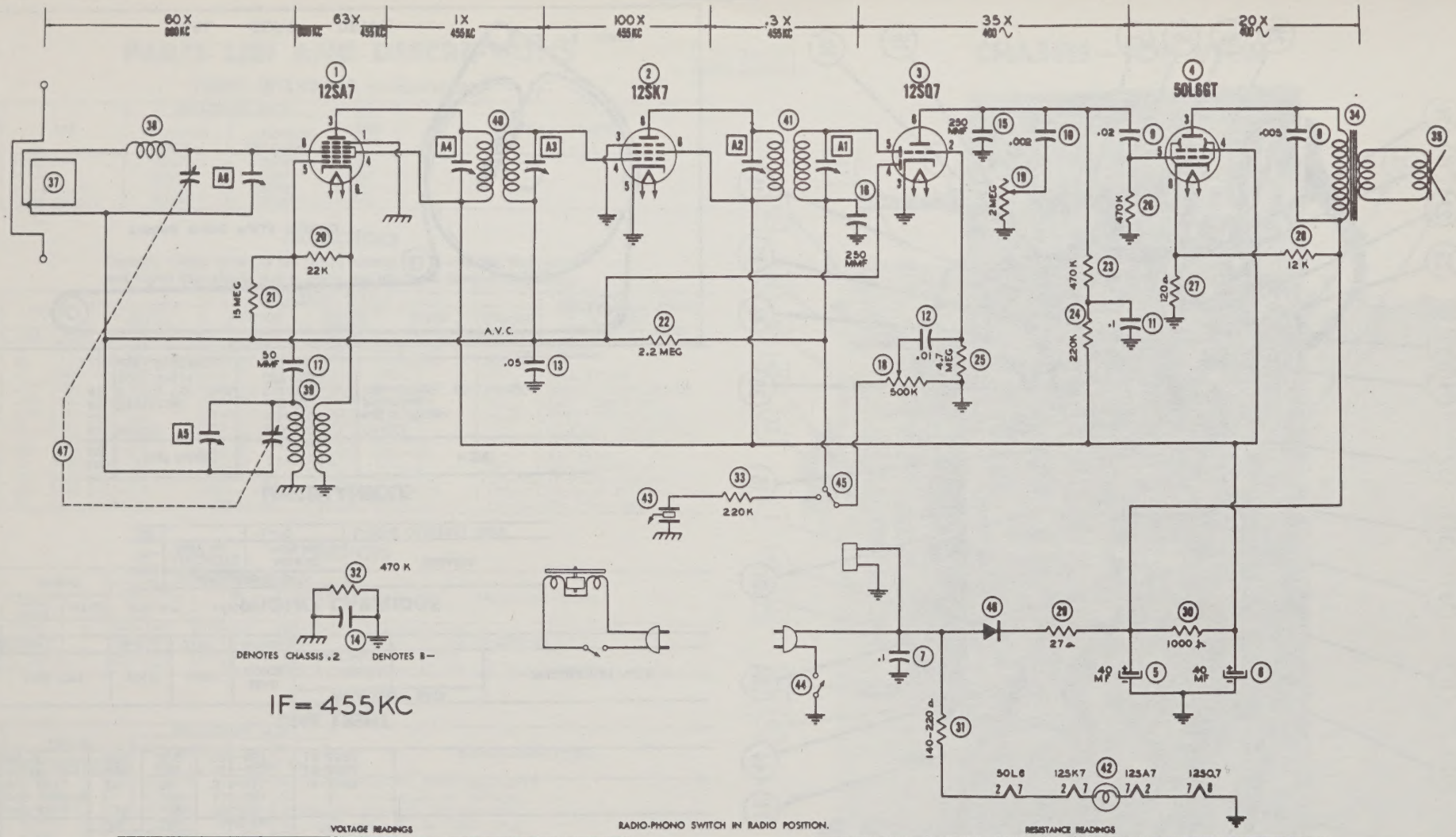
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
44	Switch	A69-169	On-Off
45	"	A69-172	Radio-Phono
46	Rectifier	A83-391	Selenium
47	2 Gang Var. Cap.	B19-193	(24-460MMF, 29-194MMF)
	Dial Scale	C67-502	
	Dial Pointer	A58-54	



CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

RADIO-PHONO SWITCH IN RADIO POSITION.

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	11VAC	105VDC	105VDC	-17VDC§	0V.	23VAC	-.5VDC
2	12SK7	0V.	41VAC	0V.	-.5VDC	0V.	105VDC	23VAC	105VDC
3	12SQ7	0V.	-.6VDC	0V.	-.6VDC	-.3VDC	45VAC	11VAC	0V.
4	50L6	0V.	90VAC	120VDC	105VDC	0V.	0V.	41VAC	6.5VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	470KΩ	12Ω	12KΩ	12KΩ	22KΩ	1Ω	24Ω	2.7 Meg.
2	12SK7	470KΩ	40Ω	0Ω	2.7 Meg.	0Ω	12KΩ	29Ω	12KΩ
3	12SQ7	470KΩ	4.7 Meg.	0Ω	2.7 Meg.	500KΩ	480KΩ	12Ω	0Ω
4	50L6	INF.	90Ω	12KΩ	12KΩ	470KΩ	0Ω	40Ω	120Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITO THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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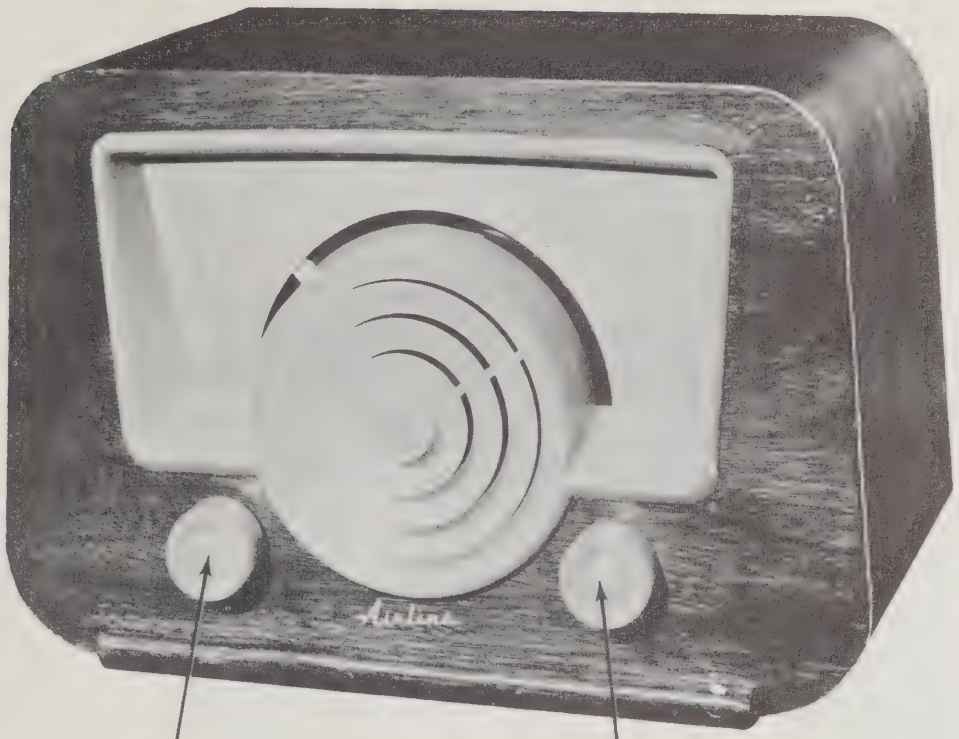
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



AIRLINE MODELS
84BR-1815B, 84BR-1816B

AIRLINE MODELS
84BR-1815B, 84BR-1816B

AIRLINE MODEL 84BR-1815B

TRADE NAME	Airline, Models 84BR-1815B, 84BR-1816B
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
TUNING RANGE—BROADCAST	535-1620KC RATING .25 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 7 (grid) of 12BE6. Low side to B-.	455KC	Tuning control fully clockwise.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.1 MFD.	"	1620KC	"	"	A5	Adjust for maximum output.
3	2 MMFD.	High side to ext. ant. clip. Low side to B-.	1620KC	"	"	A6	" " " "
4	2 MMFD.	"	1400KC	Tune for maximum output.	"	A7	Adjust for maximum output. Repeat Steps 3 & 4 until no further improvement can be made.

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PARTS LIST AND DESCRIPTIONS

AIRLINE MODEL 84BR-1816B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	A-8C-15030	AF88D	UP4415	DY-2x40-150	EL-25	Filter
B	40	150						"
7	.05	400	C-8D-10813	484-05	GT4S5	ST-4-05	TC-15	Line Filter
8	.15	400	C-8D-10953	484-15	GT4P1	ST-4-1	72P2	Line Isolation
9	.01	200	C-8D-11738	484-01	GT2S1	ST-4-01	TC-11	Output Plate Bypass
10	.05	200	C-8D-10770	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
11	.002	600	C-8D-10778	684-002	GT6D2	ST-6-002	TC-22	Conv. Screen Bypass-Note
12A	5000	300	C-8D-10935	484-005	GT6D5	ST-6-005	TC-25	Audio Coupling-Cer.
B	2000	300	C-8D-10778	484-002	GT6D2	ST-6-002	TC-22	" " "
C	220	300	C-8G-11733	1468-0002	5W5T2	M0.5-32	1FM-32	Tone Compensation-Cer.
D	220	300	C-8G-11733	1468-0002	5W5T2	M0.5-32	1FM-32	AF Plate Bypass "
13	47	300	C-8G-12198	1468-00005	5W5Q5	M0.5-45	1FM-45	Osc. Grid Cap. "
14	100	300	C-8G-11734	1468-0001	5W5T1	M0.5-31	1FM-31	Ant. Coupling "

Note-Not used in all models.

CONTROLS

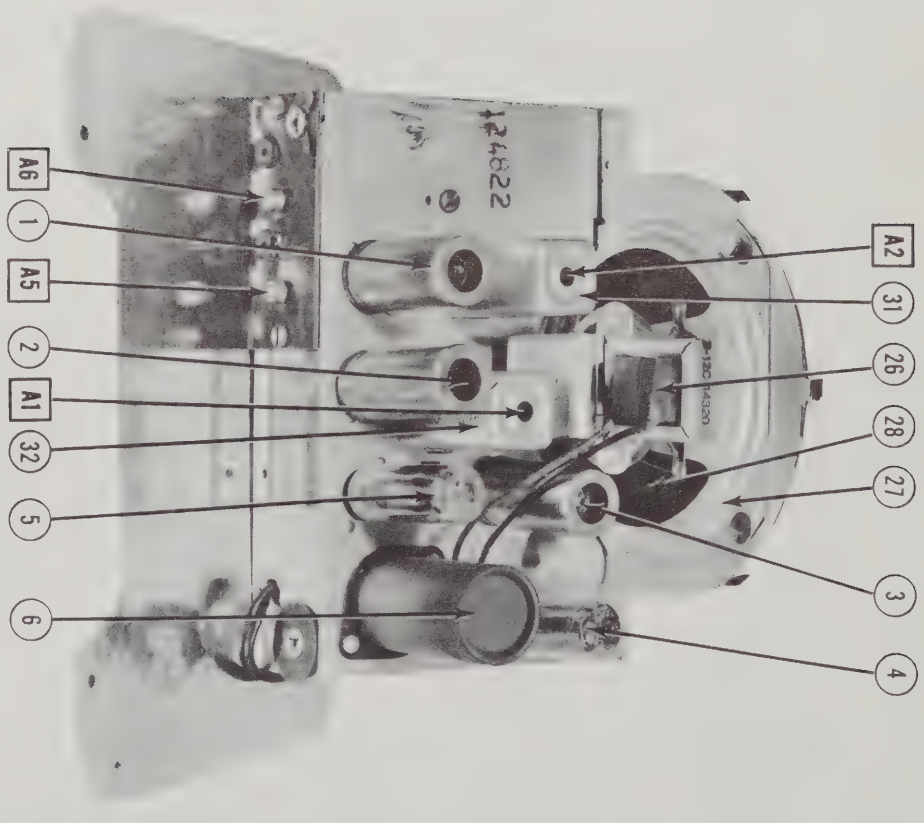
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
15A	1 Meg.	½	A-10A-12380		15/16-63-Z	Volume Control
B	Switch		Not Req.		SPST. Sw.	Attach at factory

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
16	22KΩ	½	C-9B1-78	BTS-22K	Red-Red-Or. Osc. Grid
17	470Ω	½		BTS-470	Yl.-Vi.-Br. Conv. Decoupling-See Note
18	3.3 Meg.	½	C-9B1-34	BTS-3.3 Meg	Or.-Or.-Grn. AVC Network
19	6.8 Meg.	½	C-9B1-36	BTS-6.8 Meg	Blue-Gray-Grn. AF Grid
20	220KΩ	½	C-9B1-90	BTS-220K	Red-Red-Yl. AF Plate Load
21	470KΩ	½	C-9B1-94	BTS-470K	Yl.-Vi.-Yl. Output Grid
22	150Ω	½	C-9B1-52	BW-½-150	Br.-Grn.-Br. Output Cathode
23	1000Ω	½	C-9B2-62	BTS-1000	Br.-Blk.-Red Filter
24	27Ω	½	C-9B1-43		Red-Vi.-Blk. Surge Limiter
25	470KΩ	½	C-9B1-94	BTS-470K	Yl.-Vi.-Yl. Line Isolation

Note-Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
26	1760Ω	3.2Ω	165Ω	.4Ω	B-12C-14320	A-3876#	T22S45#	A-2928#	#Drill new mounting holes and mount on chassis.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-113		
27	PM	3.2Ω	B-18A-14390	Mod. P4-X	4A07	
	CONE DIA.	VC DIA.				
28	4"	9/16"				

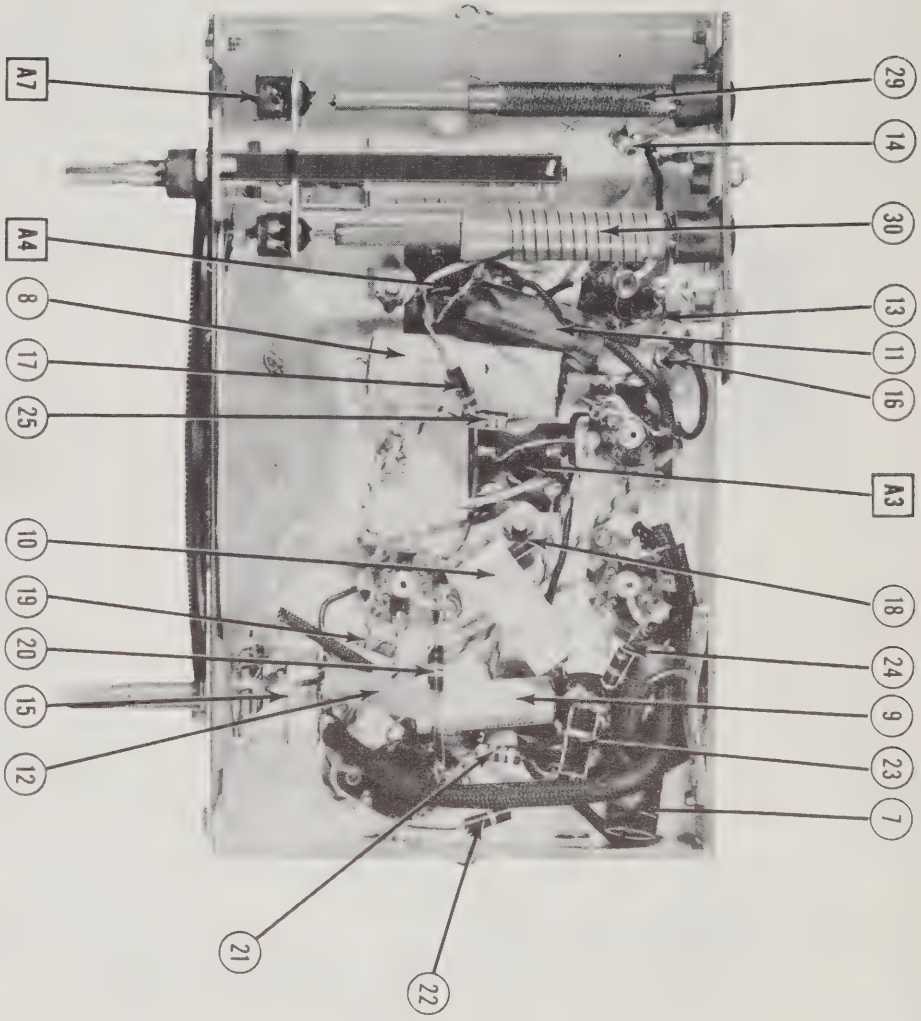
R F COILS

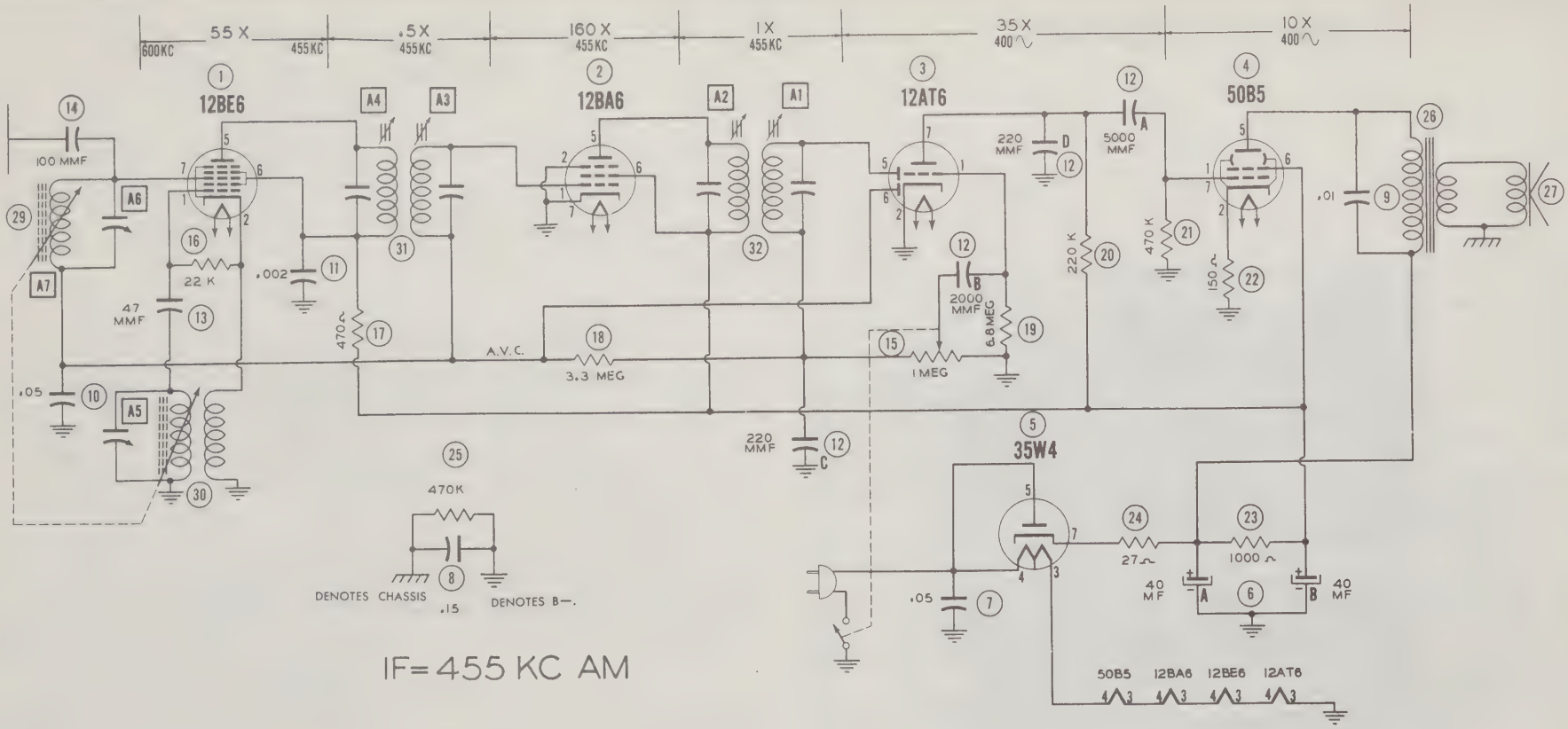
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
29	Ant. Coil		22.5Ω	A-13E-14417		
30	Osc. Coil	.5Ω	10.5Ω	A-13D-14418		Items 29-30 are slug tuned and are ganged
31	Input IF	16Ω	16Ω	B-13A-13071	16-6678	
32	Output IF	22Ω	22.5Ω	B-13B-13072	16-6678	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
	Dial Scale	B-6D-15086	
	Knob	A-5B-15067-63	Ivory
	Cabinet	D-24D-14321	Specify Walnut or Bleached

CHASSIS—BOTTOM VIEW





IF = 455 KC AM

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-5.7VDC§	0V.	12VAC	24VAC	97VDC	97VDC	-.6VDC
2	12BA6	-.7VDC	0V.	24VAC	37VAC	100VDC	100VDC	0V.
3	12AT6	-.7VDC	0V.	0V.	12VAC	-.4VDC	-.7VDC	55VDC
4	50B5	0V.	7VDC	37VAC	85VAC	118VDC	100VDC	0V.
5	35W4	0V.	0V.	85VAC	117VAC	117VAC	110VAC	128VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	22KΩ	.5Ω	13Ω	25Ω	91KΩ	91KΩ	4.3 Meg.
2	12BA6	4.3 Meg.	0Ω	25Ω	38Ω	91KΩ	91KΩ	0Ω
3	12AT6	6.8 Meg.	0Ω	0Ω	13Ω	1 Meg.	4.3 Meg.	300KΩ
4	50B5	470KΩ	150Ω	38Ω	90Ω	90KΩ	91KΩ	470KΩ
5	35W4	INF.	INF.	90Ω	120Ω	120Ω	108Ω	90KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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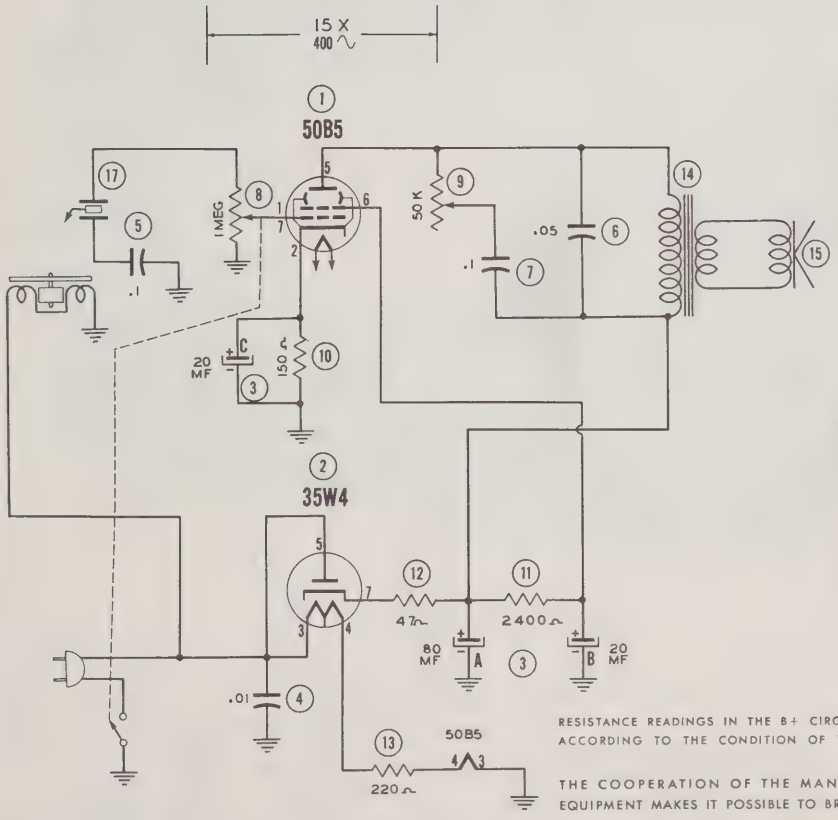
493-3

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRLINE MODEL 84GHM-926B

TRADE NAME	Airline, Model 84GHM-926B
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Player with 2 Tube Amplifier
TUBES(TWO)	Types, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC RATING .22 Amp. @ 117 Volts AC



Pin No.	50B5 Volt.	Res.
1	0V.	1 Meg.
2	7.1VDC	150Ω
3	0V.	0Ω
4	50VAC	42Ω
5	120VDC	160KΩ
6	115VDC	160KΩ
7	0V.	1 Meg.

Pin No.	35W4 Volt.	Res.
1	0V.	INF.
2	0V.	INF.
3	85VAC	57Ω
4	117VAC	34Ω
5	117VAC	34Ω
6	110VAC	40Ω
7	130VDC	160KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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493-4

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at minimum, no signal applied for voltage measurements.

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DATE 2/49-#493-4 SET #55-FOLDER #4

AIRLINE MODEL
84GHM-926B

AIRLINE MODEL
84GHM-926B

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	50B5	50B5	7BZ	
2	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	80	150	101A	AF88D4A‡	UP84215	DY-804020-150	EL-352‡	■ Filter
B	20	150		PRS150/20			UT-201	▲ "
C	20	25						Cathode Bypass
4	.01	600		684-01	GT6S1	ST-6-01	TC-11	Line Filter-See Note
5	.1	400	103A	484-.1	GT4P1	ST-4-1	TC-1	Phono Isolation
6	.05	400		484-05	GT4S5	ST-4-05	TC-25	Output Plate Bypass-Note
7	.1	400	103A	484-.1	GT4P1	ST-4-1	TC-1	Tone Compensation

‡Parallel sections to obtain desired capacity.
Note-Some models may use .02 MFD. capacitor in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
8A	1 Meg.	½	112A	D11-137	M-61-S	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 8A per instructions
C	Switch		" "	41	SW-A	" " " " "
9A	50KΩ	½	113A	D11-123	M-44-S	Tone Control
B	Shaft		Not Req.	A	Not Req.	Attach to 9A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
10	150Ω	½	109A	BW-½-150	Br.-Grn.-Br. Output Cathode
11	2400Ω	½	108A	BTS-2200	Red-Yl.-Red Filter
12	47Ω	½	110A	BW-½-47	Yl.-Vi.-Blk. Surge Limiter
13	220Ω	25	107A	DHA-250	Line Dropping

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
14	2000Ω	3.3Ω	210Ω	.5Ω	Part of 115A	A-3876‡	T22845‡	A-2928‡	‡Bend mounting tabs down, file out slots and mount on original bracket.

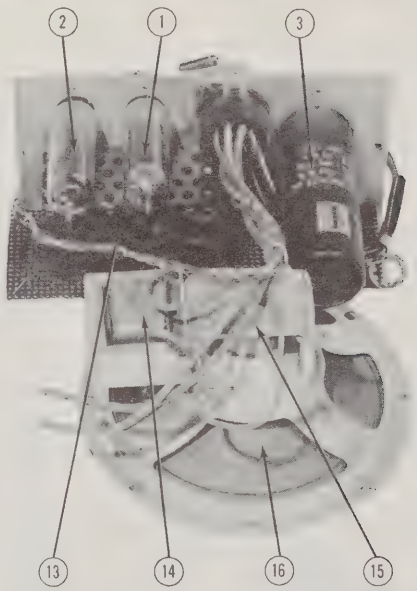
SPEAKER

ITEM No.	RATINGS	REPLACEMENT DATA: AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
15	FIELD / PM; VC IMP. 3.3Ω	115A	ST-105 Mod. P5-X	5A15	
16	CONE DIA. 4-3/4" ; VC DIA. 9/16"				

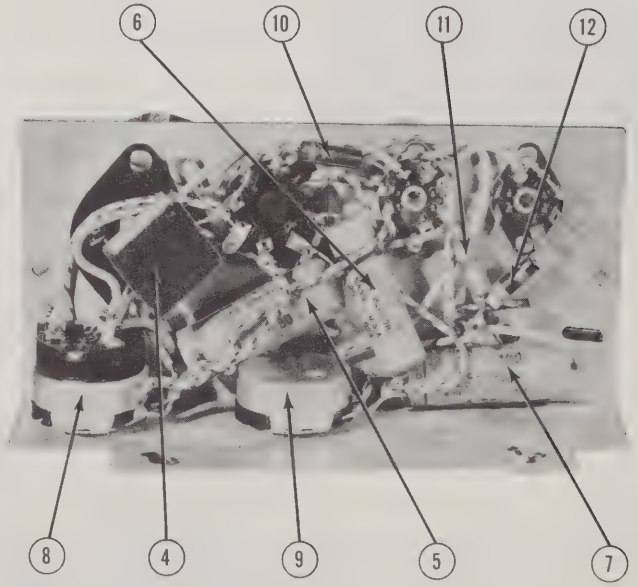
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	ASTATIC PART No.	REMARKS
17	124A	L-72A	L-72 Original Part

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



PHOTOFACT* Folder

BELMONT MODELS
22A21, 22AX21, 22AX22

IMPORTANT FILING NOTICE

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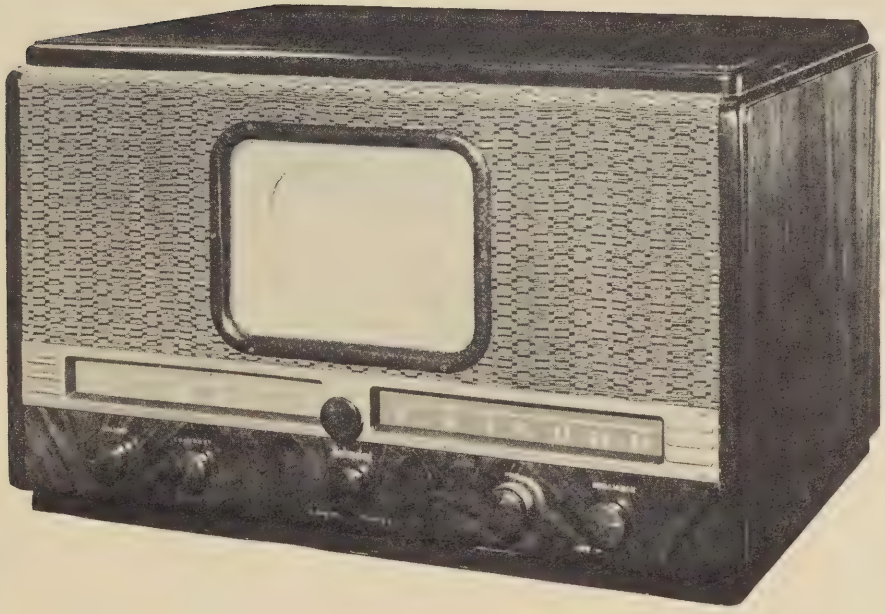
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



BELMONT MODELS
22A21, 22AX21, 22AX22

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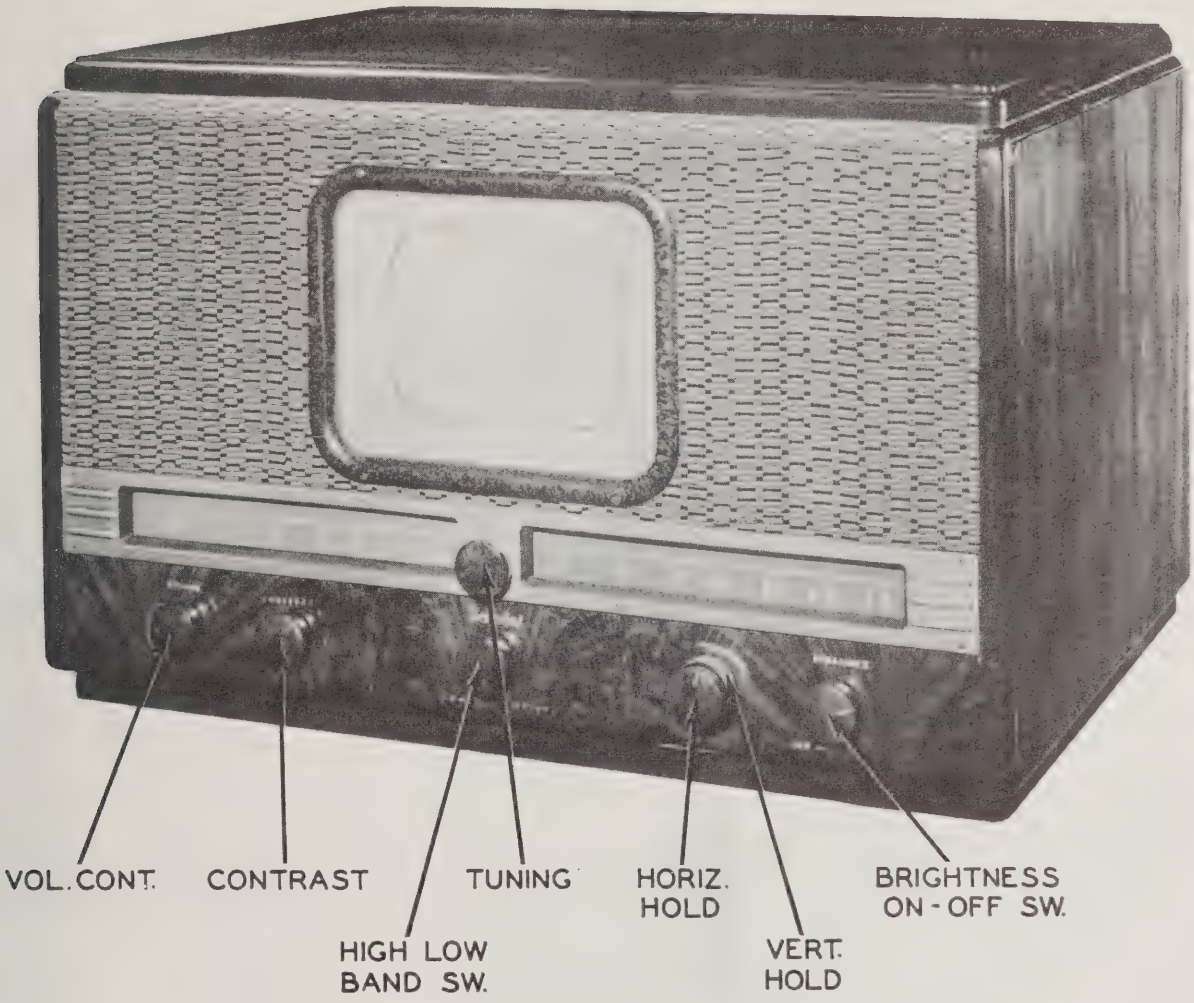
PHOTOFACT* Folder

BELMONT MODELS
22A21, 22AX21, 22AX22



BELMONT MODEL 22A21

TRADE NAME	Belmont, Models 22A21, 22AX21, 22AX22
MANUFACTURER	Belmont Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-Two
POWER SUPPLY	105 - 125 Volts AC (60 Cycle) RATING 1.55 Amps. @ 117 Volts AC
TUNING RANGE—	Channels 1 through 13

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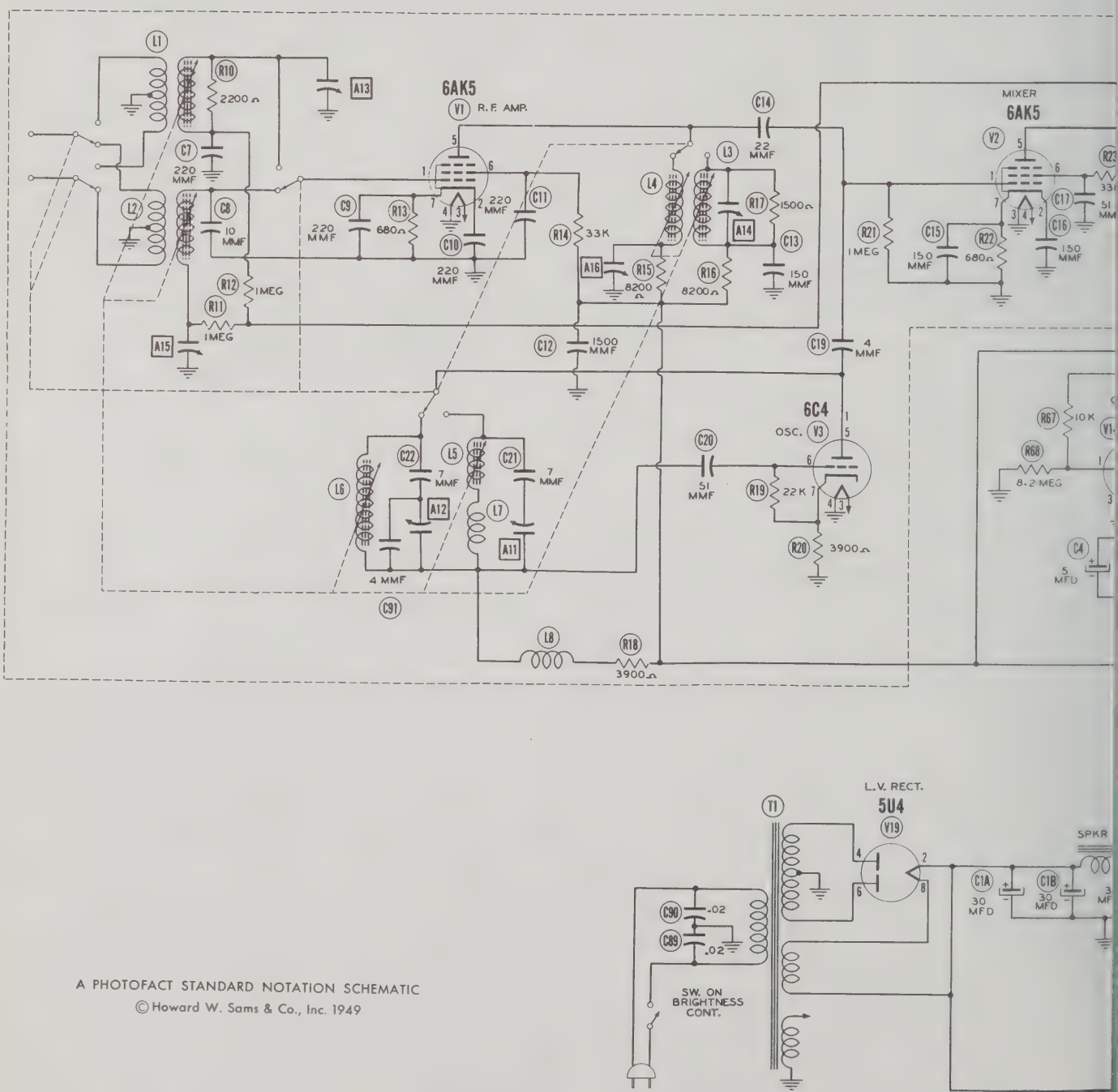
2/49-#493-5 SET #55-FOLDER #5

BELMONT MODELS
22A21, 22AX21, 22AX22



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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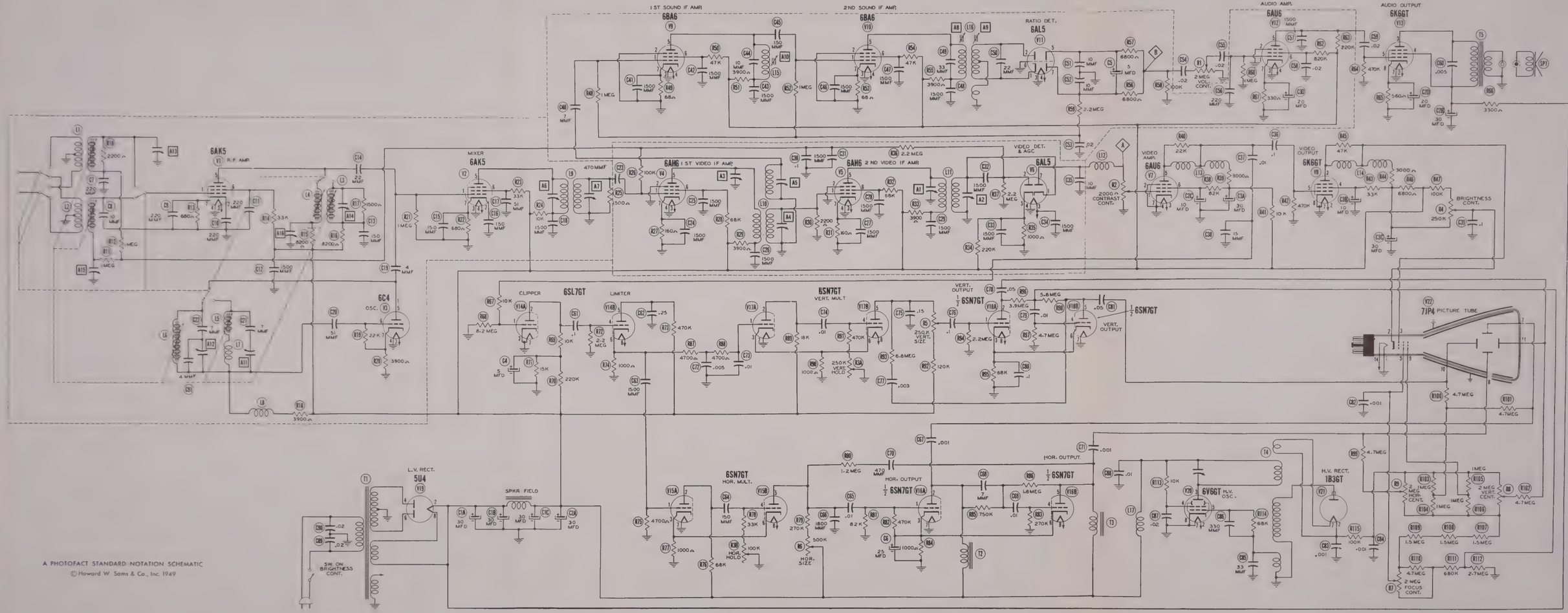

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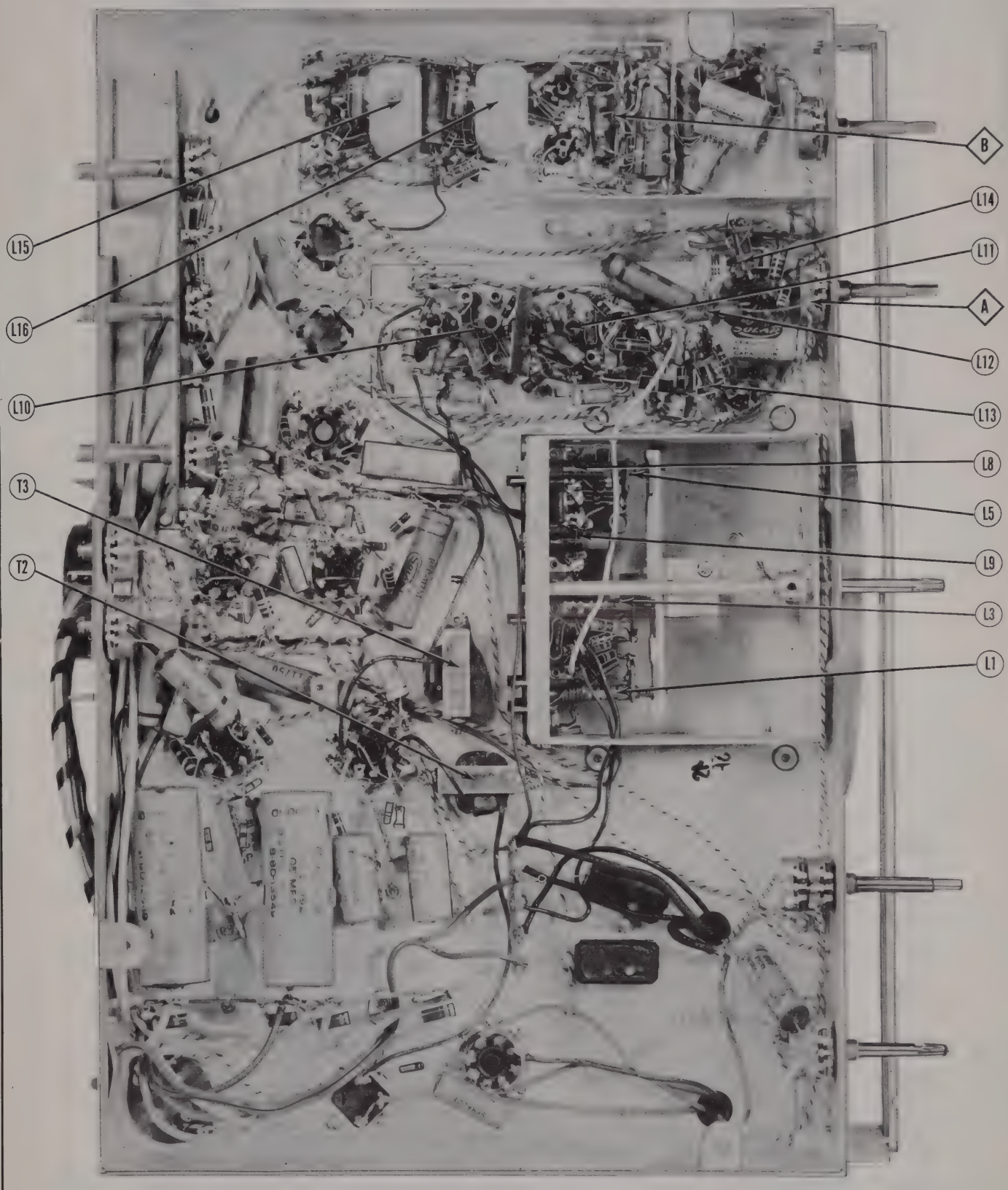
BELMONT MODELS
22A21, 22AX21, 22AX22

CHASSIS–TOP VIEW



CHASSIS BOTTOM VIEW–TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

BELMONT MODELS
22A21, 22AX21, 22AX22

TUBES (SYLVANIA or Equivalent) PARTS LIST AND DESCRIPTIONS

ITEM No.	USE	REPLACEMENT DATA: BELMONT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6AK5	6AK5	7BD	
V2	Mixer	6AK5	6AK5	7BD	
V3	Oscillator	6C4	6C4	6BG	
V4	1st V. IF Amp.	6AH6	6AH6	7BK	
V5	2nd V. IF Amp.	6AH6	6AH6	7BK	
V6	Video Det. & AGC	6AL5	6AL5	7BT	
V7	Video Amp.	6AU6	6AU6	7BK	
V8	Video Output	6K6GT	6K6GT	7S	
V9	1st S. IF Amp.	6BA6	6BA6	7BK	
V10	2nd S. IF Amp.	6BA6	6BA6	7BK	
V11	Ratio Det.	6AL5	6AL5	7BT	
V12	Audio Amp.	6AU6	6AU6	7BK	
V13	Audio Output	6K6GT	6K6GT	7S	
V14	Clipper & Lim.	6SL7GT	6SL7GT	8BD	
V15	Hor. Multivib.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6SN7GT	6SN7GT	8BD	
V17	Vert. Multivib.	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6SN7GT	6SN7GT	8BD	
V19	L. V. Rect.	5U4G	5U4G	5T	
V20	H. V. Osc.	6V6GT	6V6GT	7AC	
V21	H. V. Rect.	1B3GT	1B3GT	3C	
V22A	Picture Tube	7JP4	7JP4	3C	Used in Models 22A21 & 22AX21
B	" "	10HP4	10HP4	14-G	Used in Model 22AX22.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BELMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	450	B-8C-13601		UP11C335-2		D13039	■ Filter
B	30	450						▲ "
C	30	450						● "
C2A	30	450	B-8C-13566	AF862J4A	UP43145C		TVL-55	▲ "
B	30	450		PRS50/25	BR205*		TA-525	● "
C	10	450						■ Video Amp. Screen Output Cath. Byp.
D	20	50						
C3A	30	450	B-8C-13600	AF862J4A	UP43145C		TVL-55	■ V. Amp. Decoup.
B	10	450		PRS50/25	BR205*		TA-525	▲ V. Out. Screen
C	30	450						● V. Out. Decoup. AF Amp. Cath.
D	20	50						Clip Decoup.
C4	5	50	B-8C-11751					Stab. Cap.
C5	5	50	B-8C-11751					Hor. Output Cath.
C6	25	25	B-8C-11750	PRS25-25	BR252A	M-25-25	TA-25	Fixed Trimmer -Cer.
C7	220		C-8G-11733					" " "
C8	10		C-8G-11789					RF Cath. Byp. "
C9	220		C-8G-11733					" " " "
C10	220		C-8G-11733					RF Screen Byp. "
C11	220		C-8G-11733					RF Bypass "
C12	1500		C-8G-11731					Fixed Trimmer "
C13	150		C-8G-11788					RF Coupling "
C14	22		C-8G-11892					Mixer Cath. Byp. "
C15	150		C-8G-11788					" " " "
C16	150		C-8G-11788					Mixer Screen Byp. "
C17	51		C-8G-11891					Mixer Plate Decoup. "
C18	1500		C-8G-11731					Osc. Coup. ±½MMF "
C19	4		C-8G-11893					Osc. Grid 5% "
C20	51		C-8G-11891					Fixed Pad ±½MMF "
C21	7		C-8G-15095					" " ±1MMF "
C22	7		C-8G-15095					Video IF Coupling "
C23	470		C-8G-11732	1468-0005	5W5T5	MO.5-35	1FM-35	1st V. IF Cath. Byp."
C24	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	1st V. IF Screen.Byp."
C25	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	1st V. IF Plate Decoup Cer.
C26	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd V. IF Cath. Byp.-Cer
C27	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd V. IF Scr. Byp. "
C28	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd V. IF Plate Decoup Cer.
C29	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	
C30	.1	200	C-8D-10771	P288-.1	DT4P1	ST-4-1	TM-1	AGC Filter
C31	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	" " -Cer
C32	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	Video IF Coupling "
C33	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	RF Bypass "
C34	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	V. Det. Fil. Byp. "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BELMONT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% TOLERANCE UNLESS OTHERWISE STATED
R10	2200Ω	½	C-9B1-66		Red-Red-Red RF Amp. Grid
R11	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. AGC Network ±20%
R12	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. " " ±20%
R13	680Ω	½	C-9B1-60	BTS-680	Blue-Gray-Br. RF Amp. Cathode
R14	33KΩ	½	C-9B1-80	BTS-33K	Or.-Or.-Or. RF Amp. Screen
R15	8200Ω	½	C-9B1-73	BTS-8200	Gray-Red-Red RF Amp. Plate
R16	8200Ω	½	C-9B1-73	BTS-8200	Gray-Red-Red " " "
R17	1500Ω	½	C-9B1-64	BTS-1500	Br.-Grn.-Red RF Amp. Plate Coil Shunt
R18	3900Ω	1	C-9B2-69	BTA-3900	Or.-Wh.-Red Osc. Plate
R19	22KΩ	½	C-9B1-78		Red-Red-Or. Osc. Grid
R20	3900Ω	1	C-9B2-69		Or.-Wh.-Red Osc. Cathode
R21	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. Mixer Grid ±20%
R22	680Ω	½	C-9B1-60	BTS-680	Blue-Gray-Br. Mixer Cathode
R23	33KΩ	½	C-9B1-80		Or.-Or.-Or. Mixer Screen
R24	10KΩ	½	C-9B1-74	BTS-10K	Br.-Blk.-Or. Mixer Decoupling
R25	1500Ω	½	C-9B1-64	BTS-1500	Br.-Grn.-Red 1st IF Amp. Grid Coil Shunt
R26	100KΩ	½	C-9B1-25	BTS-100K	Br.-Blk.-Yl. 1st Video IF Amp. Grid ±20%
R27	160Ω	½	C-9B1-140		Br.-Blue-Br. 1st Video IF Amp. Cathode ± 5%
R28	68KΩ	1	C-9B2-84	BTA-68K	Blue-Gray-Or. 1st Video IF Amp. Screen
R29	3900Ω	1	C-9B2-69	BTA-3900	Or.-Wh.-Red 1st Video IF Amp. Decoupling
R30	2200Ω	½	C-9B1-66	BTS-2200	Red-Red-Red. 2nd Video IF Amp. Grid
R31	160Ω	½	C-9B1-140		Br.-Blue-Br. 2nd Video IF Amp. Cathode ±5%
R32	68KΩ	1	C-9B2-84	BTA-68K	Blue-Gray-Or. 2nd Video IF Amp. Screen
R33	3900Ω	1	C-9B2-69	BTA-3900	Or.-Wh.-Red 2nd Video IF Amp. Decoupling
R34	220KΩ	½	C-9B1-90	BTS-220K	Red-Red-Yl. Voltage Divider
R35	1000Ω	½	C-9B1-62	BTS-1000	Br.-Blk.-Red " "
R36	2.2 Meg.	½	C-9B1-102	BTS-2.2 Meg.	Red-Red-Grn. AGC Network
R37	2.2 Meg.	½	C-9B1-102		Red-Red-Grn. Diode Load
R38	82KΩ	½	C-9B1-85	BTS-82K	Gray-Red-Or. Video Amp. Screen
R39	3000Ω	½	C-9B1-170	BTS-3000 ±5%	Or.-Blk.-Red Video Amp. Plate ±5%
R40	22KΩ	½	C-9B1-21	BTS-22K	Red-Red-Or. " " " ±20%
R41	10KΩ	1	C-9B2-74	BTA-10K	Br.-Blk.-Or. Voltage Divider
R42	470KΩ	½	C-9B1-29	BTS-470K	Yl.-Vi.-Yl. Video Amp. Grid ±20%
R43	33KΩ	1	C-9B2-80	BTA-33K	Or.-Or.-Or. Video Amp. Screen
R44	3000Ω	2	C-9B4-170	BT-2-3000 ±5%	Or.-Blk.-Red Video Amp. Plate ±5%
R45	47KΩ	½	C-9B1-23	BTS-47K	Yl.-Vi.-Or. " " " ±20%
R46	6800Ω	5	C-9C12-1109	ABA-7000	Voltage Divider-See Note 4
R47	100KΩ	½	C-9B1-25	BTS-100K	Br.-Blk.-Yl. " " ±20%
R48	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. 1st Sound IF Amp. Grid ±20%
R49	68Ω	½	C-9B1-48		Blue-Gray-Blk. 1st Sound IF Amp. Cathode
R50	47KΩ	1	C-9B2-82	BTA-47K	Yl.-Vi.-Or. 1st Sound IF Amp. Screen
R51	3900Ω	½	C-9B1-69	BTS-3900	Or.-Wh.-Red 1st Sound IF Amp. Decoupling
R52	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. 2nd Sound IF Amp. Grid ±20%
R53	68Ω	½	C-9B1-48		Blue-Gray-Blk. 2nd Sound IF Amp. Cathode
R54	47KΩ	1	C-9B2-82	BTA-47K	Yl.-Vi.-Or. 2nd Sound IF Amp. Screen
R55	3900Ω	½	C-9B1-69	BTS-3900	Or.-Wh.-Red 2nd Sound IF Amp. Decoupling
R56	6800Ω	½	C-9B1-72	BTS-6800	Blue-Gray-Red Diode Load
R57	6800Ω	½	C-9B1-72	BTS-6800	Blue-Gray-Red " "
R58	100KΩ	½	C-9B1-25	BTS-100K	Br.-Blk.-Yl. " "
R59	2.2 Meg.	½	C-9B1-33	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
R60	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn. Audio Amp. Grid ±20%
R61	330Ω	½	C-9B1-10		Or.-Or.-Br. Audio Amp. Cathode
R62	820KΩ	½	C-9B1-97	BTS-820K	Gray-Red-Yl. Audio Amp. Screen
R63	220KΩ	½	C-9B1-27	BTS-220K	Red-Red-Yl. Audio Amp. Plate
R64	470KΩ	½	C-9B1-29	BTS-470K	Yl.-Vi.-Yl. Audio Output Grid ±20%
R65	560Ω	1	C-9B2-153	BTA-560 ±5%	Grn.-Blue-Br. Audio Output Cathode ±5%
R66	3300Ω	5	C-9C12-1105	ABA-3500	Filter-See Note 4
R67	10KΩ	½	C-9B1-19	BTS-10K	Br.-Blk.-Or. Isolation ±20%
R68	8.2 Meg.	½	C-9B1-109	BTS-8.2 Meg.	Gray-Red-Grn. Clipper Grid
R69	10KΩ	½	C-9B1-19	BTS-10K	Br.-Blk.-Or. Clipper Plate ±20%
R70	220KΩ	½	C-9B1-29	BTS-220K	Red-Red-Yl. Voltage Dropping-See Note 1
R71	15KΩ	½	C-9B1-20	BTS-15K	Br.-Grn.-Or. Bleeder ±20%
R72	2.2 Meg.	½	C-9B1-33	BTS-2.2 Meg.	Red-Red-Grn. Limiter Grid ±20%
R73	470KΩ	½	C-9B1-29	BTS-470K	Yl.-Vi.-Yl. Limiter Plate ±20%
R74	1000Ω	½	C-9B1-159	BTS-1000 ±5%	Br.-Blk.-Red Limiter Cathode ±5%
R75	4700Ω	½	C-9B1-17	BTS-4700	Yl.-Vi.-Red Hor. Multivibrator Grid ±20%
R76	68KΩ	½	C-9B1-203	BTS-68K ±5%	Blue-Gray-Or. Horiz. Multivibrator Plate ±5%
R77	1000Ω	½	C-9B1-159	BTS-1000 ±5%	Br.-Blk.-Red Horiz. Multivibrator Cathode ±5%
R78	33KΩ	½	C-9B1-80	BTS-33K	Or.-Or.-Or. Horiz. Multivibrator Grid
R79	270KΩ	½	C-9B1-91	BTS-270K	Red-Vi.-Yl. Horiz. Multivibrator Plate
R80	1.2 Meg.	½	C-9B1-99	BTS-1.2 Meg.	Br.-Red-Grn. Feedback
R81	82KΩ	½	C-9B1-85	BTS-82K	Gray-Red-Or. Bias Network
R82	470KΩ	½	C-9B1-29	BTS-470K	Yl.-Vi.-Yl. Horiz. Output Grid
R83	270KΩ	½	C-9B1-91	BTS-270K	Red-Vi.-Yl. " " "
R84	1000Ω	½	C-9B1-159	BTS-1000 ±5%	Br.-Blk.-Red Horiz. Output Cathode ±5%
R85	750KΩ	½	C-9B1-228	BTS-750K ±5%	Vi.-Grn.-Yl. Sweep Voltage Divider ±5%
R86	1.6 Meg	½	C-9B1-236	BTS-1.6Meg ±5%	Br.-Blue-Grn. Feedback ±5%

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Ground the AGC & AVC networks during entire alignment. Attenuate signal from signal generator to produce a maximum of .5 volt peak-to-peak signal at the video detector to prevent overloading. Connect the scope to the video detector through network as shown in Fig. 6.

Connect the synchronized sweep voltage from the sweep signal generator to the horizontal amplifier of the scope for horizontal deflection.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1	1000MMF.	High side to Pin 1 6AH6 (V5). Low side to chassis.	25MC (10MC sweep)	23.75MC & 26.75MC	9	Vert. Amp. to Point A. Low side to chassis.	A1,A2	Shunt primary of L10 with 1000 MMF. Turn A5 in. Adjust A1 & A2 for max. amplitude with marker placement per Fig. 1.
2	1000MMF.	High side to Pin 1 6AH6 (V4). Low side to chassis.	"	23.75MC & 26.75MC	"	"	A3,A4	Remove shunt in Step 1. Disconnect C23 from Pin 1 of V4. Adjust for maximum amplitude with marker placement per Fig. 1.
3	1000MMF.	"	OFF	22.25MC with 400~ modulation	"	"	A5	Adjust for minimum amplitude.
4	1000MMF.	High side to Pin 1 6AK5 (V2). Low side to chassis	25MC (10MC sweep)	22.25MC, 23.75MC & 26.75MC	"	"	A6,A7	Reconnect C23. Adjust for maximum amplitude with marker placement per Fig. 2.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5	1000MMF.	High side to Pin 1 6BA6(V10). Low side to chassis.	22.25MC (1MC sweep)	22.0MC & 22.25MC & 22.5MC	9	Vert. Amp. to Point B. Low side to chassis (Use network as shown in Fig. 6.)	A8,A9	Adjust for maximum amplitude and straightness of pattern between 22.0MC and 22.5MC markers as per Fig. 3. 22.25MC marker should be located at exact midpoint.
6	1000MMF	High side to Pin 1 6BA6 (V9). Low side to chassis.	"	"	"	"	A10	"
7	1000MMF.	High side to Pin 1 6AK5 (V2). Low side to chassis.	"	"	"	"	A5	"

OSCILLATOR ALIGNMENT

Shunt signal generator output leads with 50Ω carbon resistor and insert two 120Ω carbon resistors in series with each lead.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8	2 - 120Ω carbon res. (see preallignment instructions)	Antenna terminals	85MC (10MC sweep)	87.75MC with 400~ modulation)	6	Vert. Amp. to Point B. Low side to chassis.	A11	Adjust for minimum amplitude modulation at ends of pattern as per Fig. 4.
9	"	" "	47MC	49.75MC	1	"	L7 (If necessary)	Tune dial so marker falls at center of straight line. The indicator should fall within mark indicating Channel 1. If not expand or compress L7.
10	"	" "	57MC 63MC 69MC 79MC	59.75MC 65.75MC 71.75MC 81.75MC	2 3 4 5	"	A11,L7	Alternately adjust A11 & the compression of L7 to give the best tracking.
11	"	" "	201MC (10MC sweep)	203.75MC with 400~ modulation.	11	"	A12	Adjust for minimum amplitude modulation at ends of pattern as per Fig. 4.
12	"	" "	177MC	179.75MC	7	"	A12 (If necessary)	Tune dial so marker falls at center of line. Dial should fall within mark indicating channel 7. If not, slightly readjust A12.
13	"	" "	183MC 189MC 195MC 207MC 213MC	185.75MC 191.75MC 197.75MC 209.75MC 215.75MC	8 9 10 12 13	"		Check tracking. Slight adjust of A12 may be necessary to give best tracking.

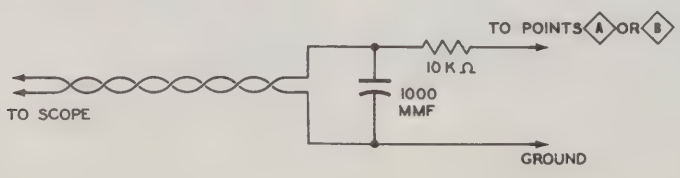


FIG. 6

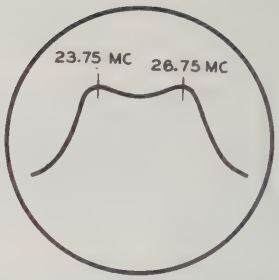


FIG. 1

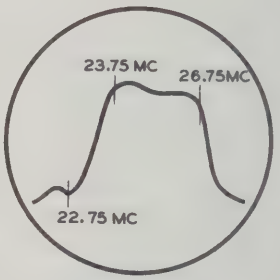


FIG. 2

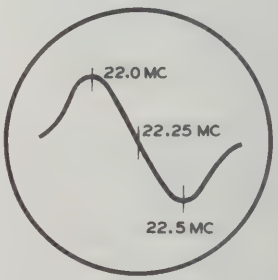


FIG. 3

FIG. 4

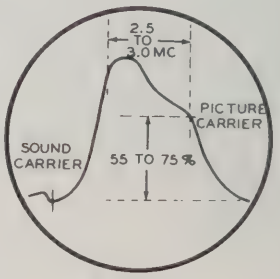


FIG. 5

ALIGNMENT INSTRUCTIONS (CONT.)

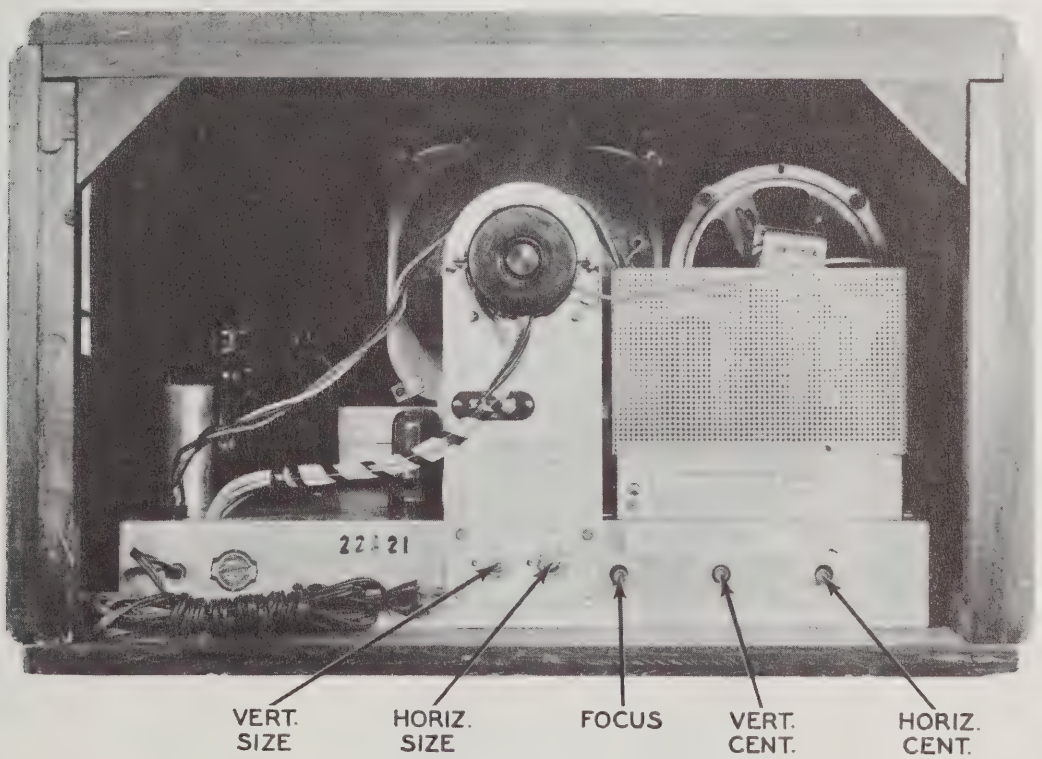
RF AMPLIFIER ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14	2-120Ω carbon res.	Antenna terminals.	85MC (10MC sweep)	87.75MC & 83.25MC	6	Vert. Amp. to Point A. Low side to chassis.	A13,A14	Tune for placement of sound marker in sound notch on each channel as shown in Figure 5. Adjust A13 & A14 for maximum amplitude and response across the low band with picture carrier marker placement as shown in Fig. 5.
			79MC	81.75MC & 77.25MC	5			
			69MC	71.75MC & 67.25MC	4			
			63MC	65.75MC & 61.25MC	3			
			57MC	59.75MC & 55.25MC	2			
			47MC	49.75MC & 45.25MC	1			
15	"	"	213MC (10MC sweep)	215.75MC & 211.25MC	13	"	A15,A16	Tune for placement of sound marker in sound notch on each channel as shown in Figure 5. Adjust A15 & A16 for maximum amplitude and response across the high band with picture carrier marker placement as shown in Fig. 5.
			207MC	209.75MC & 205.25MC	12			
			201MC	203.75MC & 199.25MC	11			
			195MC	197.75MC & 193.25MC	10			
			189MC	191.75MC & 187.25MC	9			
			183MC	185.75MC & 181.25MC	8			
			177MC	179.75MC & 175.25MC	7			

ADJUSTMENT OF TUNING STOPS AND DIAL INDICATOR

The tuning shaft should make 12½ revolutions from stop to stop. The stops may be reset by loosening with a #6 Allen wrench and rotating them to give the proper travel of the tuning slugs.

In order to set the position of the red dial indicator, remove the dial scale. Turn the tuning control fully counter-clockwise and set the left end of the indicator at the marker near the left end of the dial backplate. Replace dial scale so that the ends butt up against the stops.



CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type knobs.
2. Unplug speaker cable.
3. Remove 4 chassis bolts from bottom of cabinet.
4. Slide chassis out to rear.
5. Remove 4 screws and washers holding speaker and remove.

C35	10		C-8G-11789					RF Bypass "	R87	4700Ω	½	C-9B1-17	BTS-4700	Yl.-Vi.-Red	Integrator	±20%
C36	.1	400	C-8D-10760	P488-.1	DT4P1	ST-4-1	TM-1	Video Coupling	R88	4700Ω	½	C-9B1-17	BTS-4700	Yl.-Vi.-Red	"	±20%
C37	.01	400	C-8D-10761	P488-01	DT4S1	ST-4-01	TM-11	" "	R89	18KΩ	1	C-9B2-77	BTA-18K	Br.-Gray-Or.	Vert. Multi. Plate	
C38	15		C-8G-13017					Integrator "	R90	1000Ω	½	C-9B1-159	BTS-1000 ±5%	Br.-Blk.-Red	Vert. Multivibrator Cathode	±5%
C39	.1	400	C-8D-10760	P488-.1	DT4P1	ST-4-1	TM-1	Pic. Tube Cath.	R91	470KΩ	½	C-9B1-29	BTS-470K	Yl.-Vi.-Yl.	Vert. Multivibrator Grid	±20%
C40	7		C-8G-11790					Sound IF Coup. "	R92	120KΩ	½	C-9B1-87	BTS-120K	Br.-Red-Yl.	Vert. Multivibrator Plate	
C41	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	1st S. IF Cath. Byp. "	R93	6.8 Meg.	½	C-9B1-108	BTS-6.8 Meg.	Blue-Gray-Grn.	Feedback	
C42	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	1st S. IF Scr. Byp. "	R94	2.2 Meg.	½	C-9B1-33	BTS-2.2 Meg.	Red-Red-Grn.	Vert. Output Grid	±20%
C43	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	1st S. IF Plate Decoup. Cer.	R95	68KΩ	½	C-9B1-203	BTS-68K ±5%	Blue-Gray-Or.	Vert. Output Cathode	±5%
C44	10		C-8G-11789					Fixed Trimmer Cer.	R96	3.9 Meg.	½	C-9B1-245	BTS-3.9Meg.±5%	Or.-Wh.-Grn.	Vert. Output Plate	±5%
C45	150		C-8G-11788	1468-00015	5W5T15	MO.5-315	1FM-315	Sound IF Coupling "	R97	4.7 Meg.	½	C-9B1-106	BTS-4.7 Meg.	Yl.-Vi.-Grn.	Vert. Output Grid	
C46	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd S. IF Cath. Byp. "	R98	5.6 Meg.	½	C-9B1-249	BTS-5.6Meg.±5%	Grn.-Blue-Grn.	Vert. Output Plate	±5%
C47	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd S. IF Scr. Byp. "	R99	4.7 Meg.	1	C-9B2-35		Yl.-Vi.-Grn.	Deflection Plate Load	±20%
C48	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	2nd S. IF Plate Decoup-Cer.	R100	4.7 Meg.	1	C-9B2-35		Yl.-Vi.-Grn.	" " "	±20%
C49	33	500	C-8F3-107					Fixed Trimmer	R101	4.7 Meg.	1	C-9B2-35		Yl.-Vi.-Grn.	" " "	±20%
C50	22		C-8G-13909					" " Cer	R102	4.7 Meg.	1	C-9B2-35		Yl.-Vi.-Grn.	" " "	±20%
C51	10		C-8G-11789					Diode Load Cap. "	R103	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn.	Voltage Divider	±20%
C52	10		C-8G-11789					" " "	R104	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn.	" "	±20%
C53	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	AVC Filter	R105	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn.	" "	±20%
C54	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	Audio Coupling	R106	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Br.-Blk.-Grn.	" "	±20%
C55	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	" "	R107	1.5 Meg.	1	C-9B2-100		Br.-Grn.-Grn.	" "	
C56	220		C-8G-11733					RF Bypass "	R108	1.5 Meg.	1	C-9B2-100		Br.-Grn.-Grn.	" "	
C57	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	AF Plate Bypass "	R109	1.5 Meg.	1	C-9B2-100		Br.-Grn.-Grn.	" "	
C58	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	AF Screen Bypass	R110	4.7 Meg.	½	C-9B1-106		Yl.-Vi.-Grn.	Focus Control Shunt-See Note 2	
C59	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	Audio Coupling	R111	680KΩ	1	C-9B2-96	BTA-680K	Blue-Gray-Yl.	Voltage Divider-See Note 3	
C60	.005	600		P688-005	DT6D5	ST-6-005	TM-25	Output Plate Bypass	R112	2.7 Meg.	1	C-9B2-103		Red-Vi.-Grn.	" "	
C61	.1	400	C-8D-10760	P488-.1	DT4P1	ST-4-1	TM-1	Sync. Coupling	R113	10KΩ	1	C-9B2-74	BTA-10K	Br.-Blk.-Or.	Hi. Volt. Osc. Screen	
C62	.25	400	C-8D-13439	P488-.25	DT4P25	ST-4-25	TM-2	Sync. Lim. Plate Byp.	R114	68KΩ	½	C-9B1-24	BTS-68K	Blue-Gray-Or.	Hi. Volt. Osc. Grid	±20%
C63	1500		C-8G-11731	1467-0015	1W5D15	MW.5-215	1FM-215	Hor. Sync. Coup. "	R115	100KΩ	1	C-9B2-25	BTA-100K	Br.-Blk.-Yl.	Hi. Volt. Filter	±20%
C64	150	500	C-8F3-115	1468-00015	5W5T15	MO.5-315	1FM-315	Feedback								
C65	.01	400	C-8D-10761	P488-01		ST-4-01	TM-11	Hor. Sweep Coupling								
C66	1800	500	C-8F6-128					Hor. Discharge								
C67	.001	5000	B-8D-13523		DSTH50D1	STM-60-0005	TVM-216	Hor. Sweep Coup. "								
C68	7		C-8G-11790					" " " ±½MMF"								
C69	.01	600	C-8D-1128	P688-01	DT6S1	ST-6-01	TM-11	" " "								
C70	470	500	C-8F6-121	1468-0005	5W5T5	MO.5-35	1FM-35	Feedback								
C71	.001	500	B-8D-13523	P688-001	DT6D1	ST-6-001	TM-21	Hor. Sweep Coupling								
C72	.005	600	C-8D-10935	P688-005	DT6D5	ST-6-005	TM-25	Integrating Network								
C73	.01	400	C-8D-10761	P488-01	DT4S1	ST-4-01	TM-11	" "								
C74	.01	400	C-8D-10761	P488-01	DT4S1	ST-4-01	TM-11	Feedback								
C75	.15	400	C-8D-14141					Vert. Discharge								
C76	.1	400	C-8D-10760	P488-.1	DT4P1	ST-4-1	TM-1	Vert. Sync. Coup.								
C77	.003	1000	C-8D-13692					Feedback								
C78	.05	5000	B-8D-13549					Vert. Sweep Coup.								
C79	.01	1000	C-8D-13693			STM-10-10		" " "								
C80	.1	200	C-8D-10771	P488-.1	DT4P1	ST-4-1	TM-1	Vert. Out. Cath.								
C81	.05	5000	B-8D-13549		DSTH50S5			Vert. Sweep Coup.								
C82	.001	3000	B-8D-11728		DSTH30D1	STM-30-001	TVM-216	Focus Anode Bypass								
C83	.001	5000	B-8D-13523		DSTH50D1	STM-60-001	TVM-216	H. V. Filter								
C84	.001	5000	B-8D-13523		DSTH50D1	STM-60-001	TVM-216	H. V. Filter								
C85	33	500	C-8F3-107					Fixed Trimmer								
C86	330	500	C-8F6-119					H. V. Osc. Grid								
C87	.02	400	C-8D-10774	P488-02	DT4S2	ST-4-02	TM-12	H. V. Osc. Screen								
C88	.01	400	C-8D-10761	P488-01	DT4S1	ST-4-01	TM-11	H. V. Osc. Plate Decoup.								
C89	.02	600	C-8J-11321	P688-02	DT6S2	ST-6-02	TM-12	Line Filter								
C90	.02	600	C-8J-11321	P688-02	DT6S2	ST-6-02	TM-12	" "								
C91	4							Fixed Trimmer								

*Do not use bypass on UP capacitor.

Note 1-Some models use 470KΩ in this application.
Note 2-Early models use 1 Meg. in this application.
Note 3-Early models use 1.2 Meg. in this application.
Note 4-Set slider 200Ω from one end.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	RESISTANCE	WATTS	BELMONT PART No.	CLAROSTAT PART No.	IRC PART No.	
R1A	2 Meg.	½	A-10B-13873	AM-66-Z	D13-139	Volume
B	Shaft			KSS-3	E	Attach to R1A per instructions
R2A	2000Ω	½	C-10B-11621**	AM-11-S	D11-110	Contrast
B	Shaft			KSS-3	E	Attach to R2A per instructions
R3	250KΩ & 100KΩ	½ ½	B-10B-13529††			Vert. Hold } Dual Control Horiz. Hold. } Dual Control
R4A	250KΩ	½	A-10A-13874§	AM-55-S	D11-130	Brightness & On-Off Switch
B	Shaft			KSS-3	E	Attach to R4A per instructions
C	Switch			SW-A	41	" " " " "
R5A	250KΩ	½	C-10B-13710♦	M-55-S	D11-130	Vert. Size
B	Shaft			Not Req.	A	Attach to R5A per instructions
R6A	500KΩ	½	C-10B-11622	M-58-S	D11-133	Horiz. Size
B	Shaft			Not Req.	A	Attach to R6A per instructions
R7	2 Meg.	½	B-10B-13540‡			Focus
R8	2 Meg.	½	B-10B-13540‡			Vert. Centering
R9	2 Meg.	½	B-10B-13540‡			Horiz. Centering

**In Model 22AX22 this part number is A-10B-15355.
†† " " " " " " " B-10B-15356.
§ " " " " " " " A-10A-15354.
♦ " " " " " " " A-10B-15353.
‡ " " " " " " " B-10B-13540-1.
} Clarostat & IRC replacements same as above.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	BELMONT PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
T1A	1.55 A. @ 117VAC	175 MA. @ 650V.	3 Amp. @ 5 V.	7.8 Amp. @ 6.3V.	C-12A-11640#			P-3108*
B					C-12A-15290†			

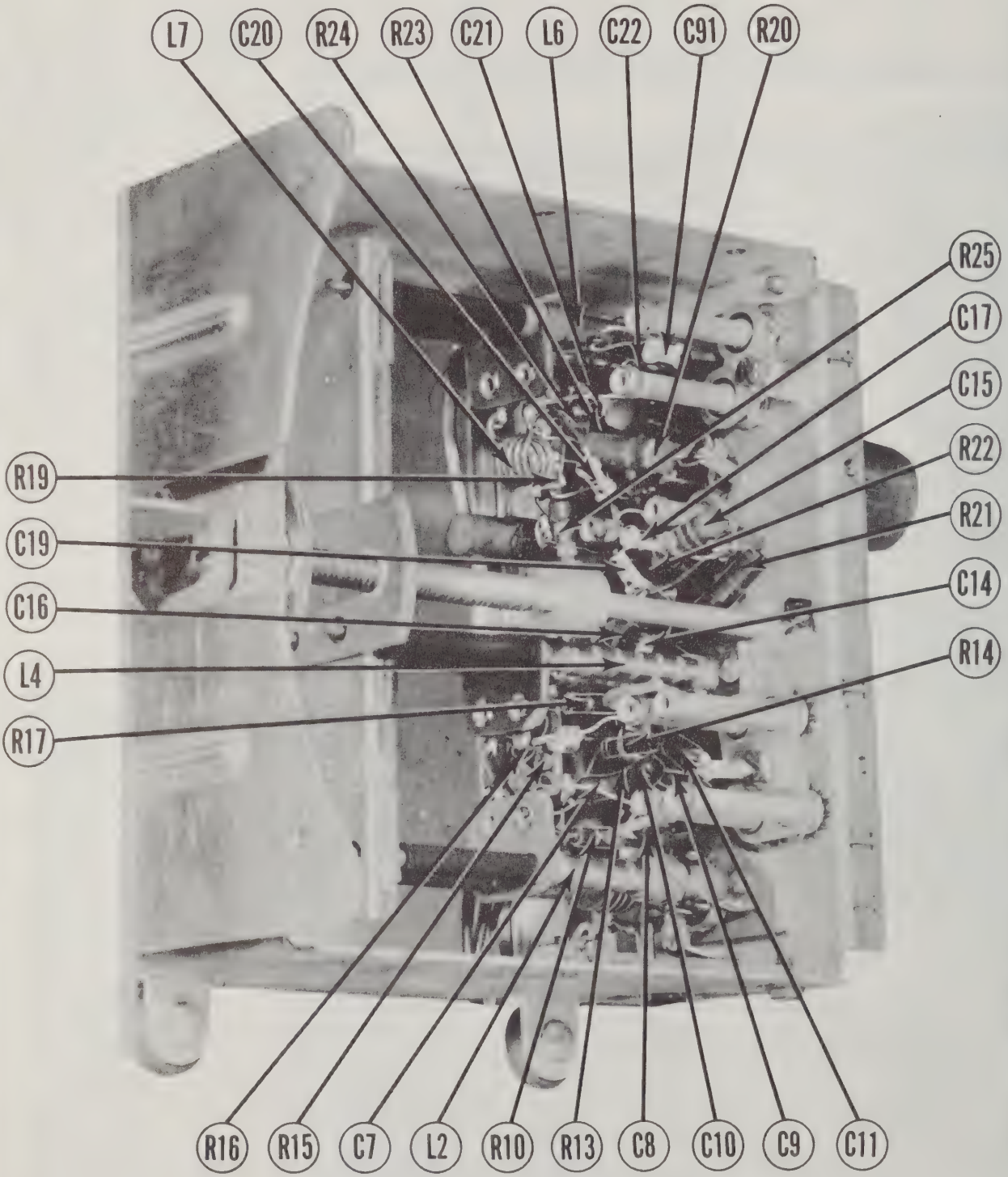
*Do not use 6.3 V. @ .6 Amp. secondary winding.
#On Model #22AX21 only. † On Models #22AX21 and 22AX22.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE PRI.	DC RESISTANCE SEC.	BELMONT PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	
T2	95Ω		B-16B-11644				Horiz. Sweep Choke
T3	95Ω		B-16B-11644				" " "
T4	1.5Ω	SEC. 1 200Ω SEC. 2 0Ω SEC. 3 35Ω	B-13D-13544				Hi. Volt Trans.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	BELMONT PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
T5	7800Ω	3.2Ω	700Ω	.7Ω	B-12C-10235-2	A-3878	T22847	A-2031	


L7
C20
R24
R23
C21
L6
C22
C91
R20
R25
C17
C15
R22
R21
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R14
R19
C19
C16
L4
R17
R16
R15
C7
L2
R10
R13
C8
C10
C9
C11

TUNER

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA BELMONT PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L1A	Ant. Input Coil, Low	0Ω		A-13G-11939		L1A thru L9 complete in Tuner Assembly
B	RF Grid Coil, Low	0Ω		B-13E-12046		
L2A	Ant. Input Coil, High	0Ω		A-13G-11938		
B	RF Grid Coil, High	0Ω		B-13E-12048		
L3	RF Coil, Low	0Ω		B-13E-12046		
L4	RF Coil, High	0Ω		B-13E-12048		
L5	Osc. Coil, Low	0Ω		B-13D-12155		
L6	Osc. Coil, High	0Ω		A-13D-12045		
L7	Osc. Track. Coil	.2Ω		A-13G-12043		
L8	RF Choke	.5Ω		A-16A-11919		
L9	1st Video IF	.2Ω	.2Ω	A-13A-11610		
L10	2nd Video IF	.2Ω	.1Ω	B-13A-11664		
L11	3rd Video	.2Ω	.1Ω	B-13A-11665		
L12	Peaking Coil	3.5ΩCT		B-16A-13533		
L13	" "	14Ω CT		B-16A-13530		
L14	" "	12Ω CT		B-16A-13530-1		
L15	Sound IF	.2Ω		B-13A-11707		
L16A	Ratio Det.	.1Ω		B-13B-13547		Primary and Tertiary
B	" "		.1Ω	B-13B-13548		Secondary
L17	RF Choke	18Ω		B-16A-13524		

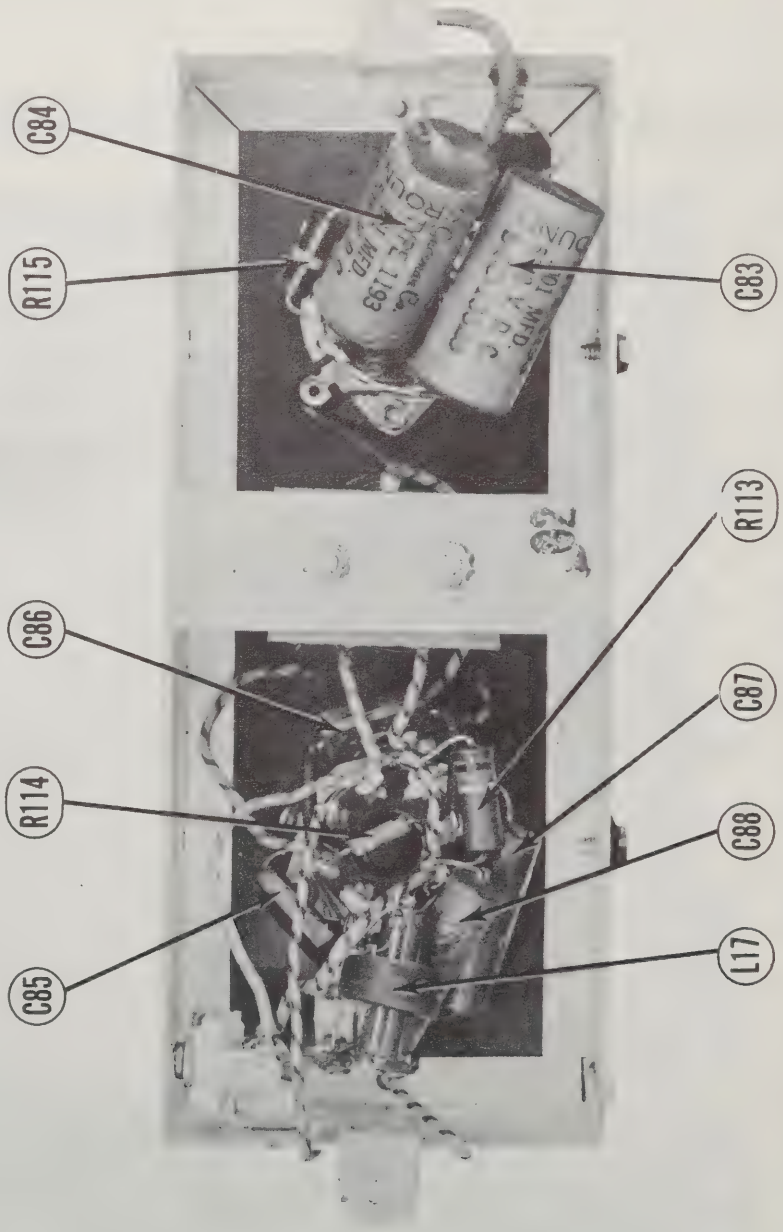
Form 405

SPEAKER

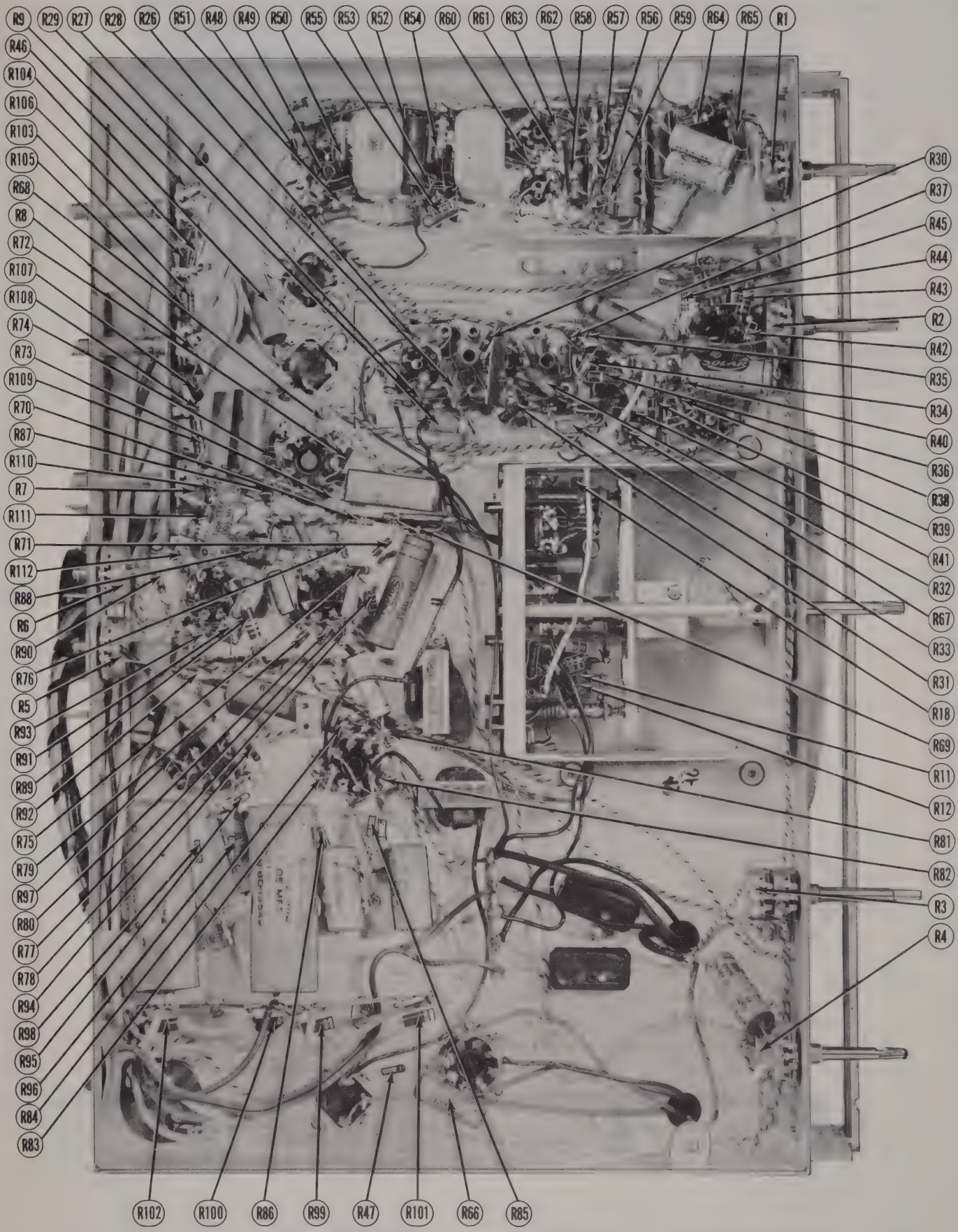
ITEM No.	RATINGS		REPLACEMENT DATA BELMONT PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	INSTALLATION NOTES
	FIELD RES.	VC IMP.				
SP1A	210Ω	3.2Ω	C-18B-13536			6" speaker used in Models 22A21 & 22AX21 only.
B			C-18B-15371			8" speaker used in Model 22AX22 only.
	CONE DIA.	VC DIA.				
SP2	5-7/8"	3/4"				

MISCELLANEOUS

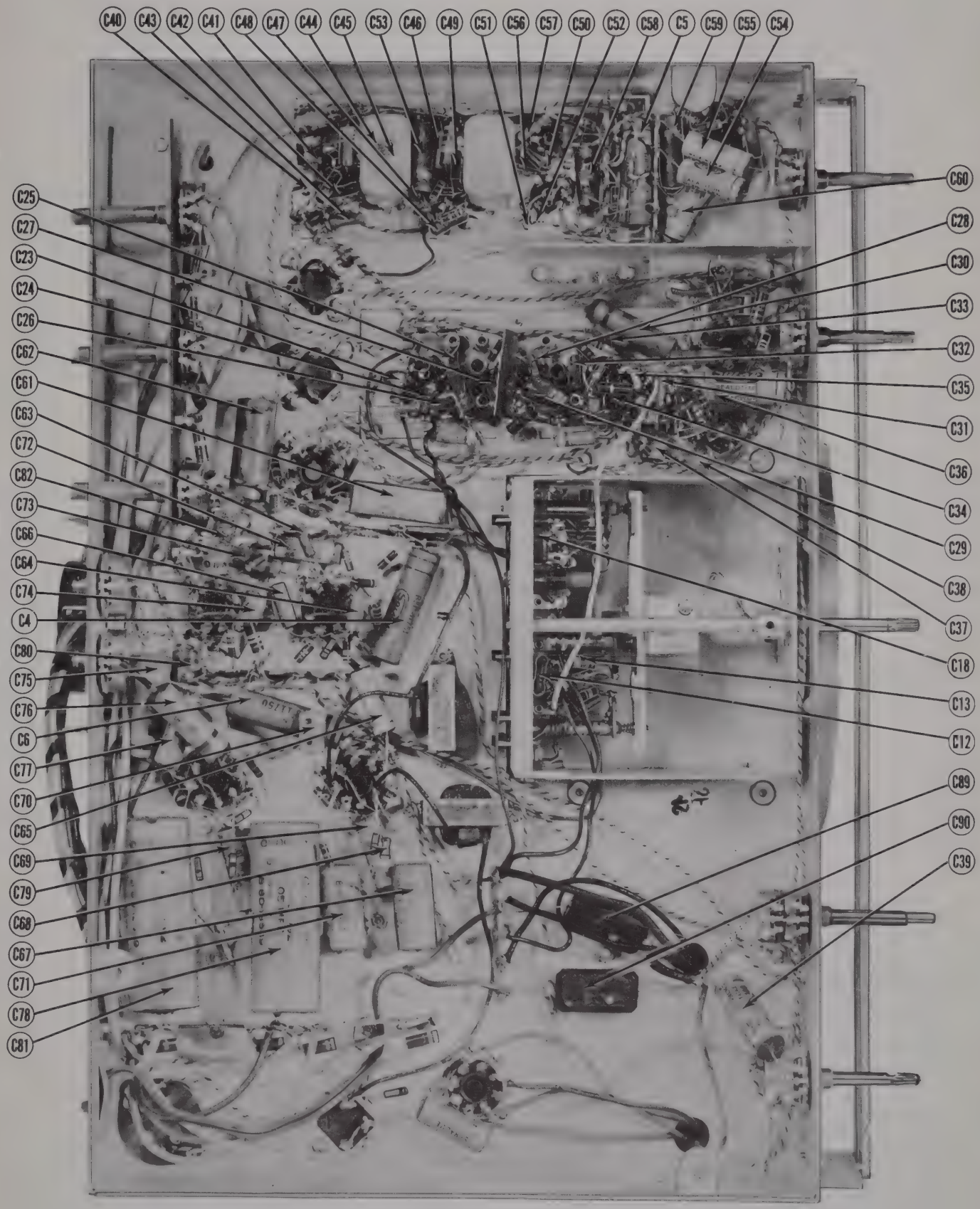
ITEM No.	PART NAME	BELMONT PART No.	NOTES
	Socket	A-19B-11974	Antenna
	"	A-15B-11538	Speaker
	Dial Indicator Tape	B-2C-11655	Used in Models #22A21 & 22AX21 only.
	Dial Scale High Band	B-6D-11705	" " " " " "
	Dial Scale Low Band	B-6D-11705-1	" " " " " "
	Protective Glass	B-6A-13546	Picture Tube-Used on Models #22A21 & 22AX21 only.
	Knob	B-5B-12278-41	All but Vert. Hold. used on Models #22A21 & #22AX21 only. Model #22AX22 obtainable under Part #B-5B-12278-61.
	"	A-5B-13565-41	Vertical Hold used on Models #22A21 & 22AX21 only. Model #22AX22 obtainable under Part #A-5B-13565-61.
	Socket & Cable Assby.	C-15B-11719-1	Picture Tube used on Models #22A21 & 22AX21 only. Model #22AX22 obtainable under Part #C-15B-11719-2.
	Escutcheon	C-5C-12246-40	Used on Models #22A21 & #22AX21 only.



H.V. POWER SUPPLY-BOTTOM VIEW



CHASSIS BOTTOM VIEW–RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
V 1	6AK5	0V.	7VDC	6.3VAC	0V.	220VDC	225VDC	7VDC	-	- -
V 2	6AK5	0V.	7.8VDC	0V.	6.3VAC	220VDC	210VDC	7.8VDC	-	-
V 3	6C4	235VDC	0V.	6.3VAC	0V.	235VDC	65VDC§	50VDC	-	-
V 4	6AH6	.1VDC	0V.	6.3VAC	0V.	250VDC	110VDC	2.5VDC	-	-
V 5	6AH6	0V.	0V.	6.3VAC	0V.	265VDC	175VDC	1.7VDC	-	-
V 6	6AL5	1.5VDC	-.3VDC	6.3VAC	0V.	0V.	0V.	-3VDC	-	-
V 7	6AU6	-.3VDC	0V.	6.3VAC	0V.	205VDC	67VDC	0V.	-	-
V 8	6K6GT	0V.	6.3VAC	118VDC	83VDC	-.4VDC	0V.	0V.	0V.	-
V 9	6BA6	0V.	0V.	0V.	6.3VAC	260VDC	110VDC	1VDC	-	-
V 10	6BA6	0V.	0V.	0V.	6.3VAC	260VDC	110VDC	.8VDC	-	-
V 11	6AL5	0V.	0V.	0V.	6.3VAC	.2VDC	0V.	-.2VDC	-	-
V 12	6AU6	-.3VDC	0V.	0V.	6.3VAC	120VDC	37VDC	.4VDC	-	-
V 13	6K6GT	0V.	6.3VAC	230VDC	245VDC	0V.	0V.	0V.	16VDC	-
V 14	6SL7GT	-.7VDC	20VDC	0V.	-.2VDC	70VDC	.5VDC	0V.	6.3VAC	-
V 15	6SN7GT	0V.	105VDC	3.5VDC	-2VDC	32VDC 45VDC	3.5VDC	0V.	6.3VAC	-
V 16	6SN7GT	1.3VDC	300VDC	12VDC	0V.	300VDC	12VDC	0V.	6.3VAC	-
V 17	6SN7GT	.4VDC	190VDC	6.8VDC	-17VDC	127VDC	6.8VDC	0V.	6.3VAC	-
V 18	6SN7GT	0V. -1VDC	230VDC	15VDC	0V.	190VDC	15VDC	0V.	6.3VAC	-
V 19	5U4	240VDC	340VDC	255VDC	350VAC	0V.	350VAC	0V.	340VDC	-
V 20	6V6GT	0V.	6.3VAC	310VDC	220VDC	-100V	0V.	0V.	0V.	-
V 21	1B3GT	DO NOT MEASURE.								

	PINS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V 22	7JP4 10HP4	0V.	170VDC	120VDC	0V.	#	0V.	#	#	#	#	#	0V.	0V.	6.3VAC

#DO NOT MEASURE. ACCURATE MEASUREMENTS CAN NOT BE MADE DUE TO HIGH IMPEDANCE OF THE CIRCUIT.

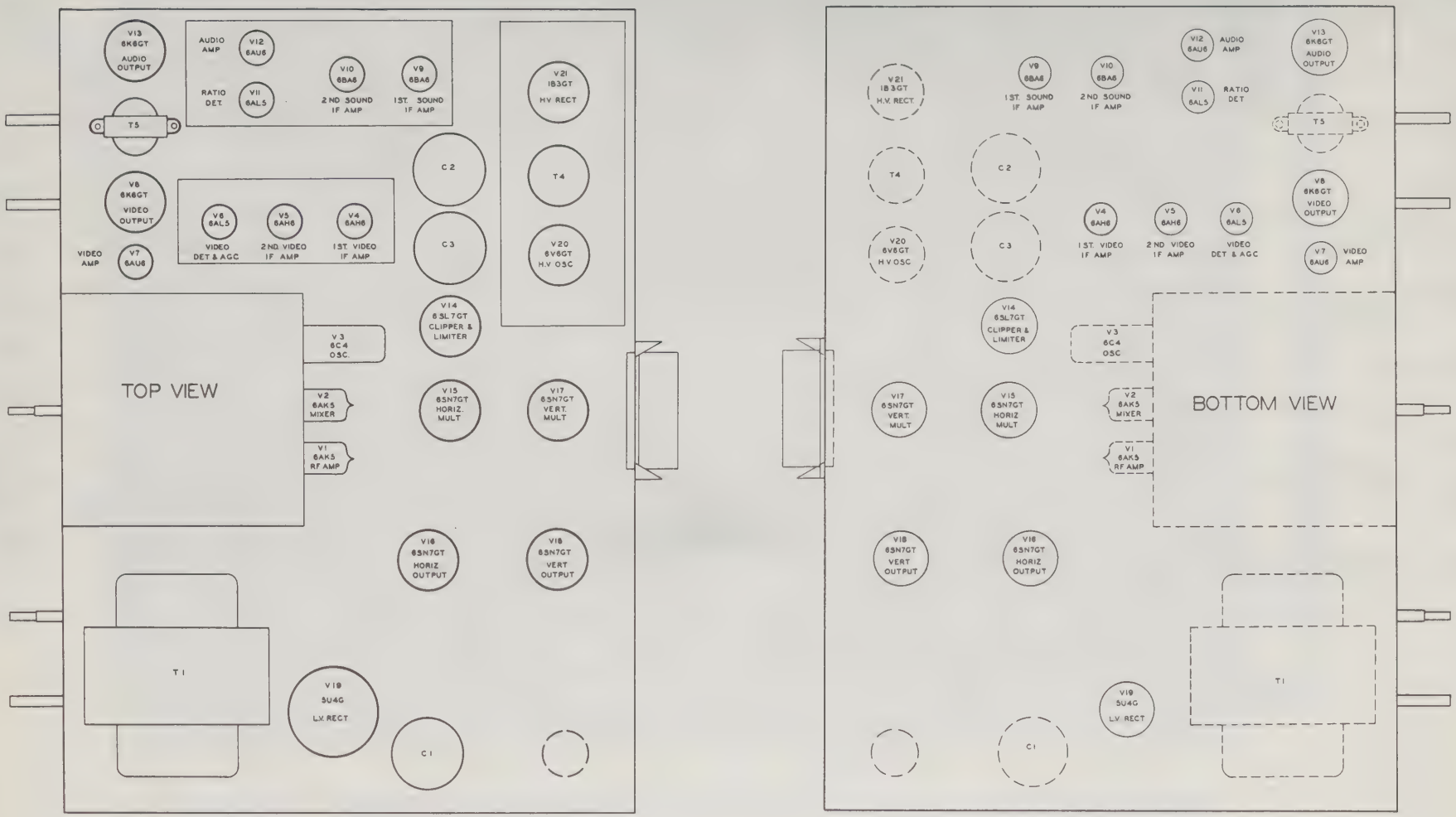
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
V 1	6AK5	6 Meg.	680Ω	.1Ω	0Ω	8.2KΩ*	33KΩ*	680Ω	-	-
V 2	6AK5	1 Meg.	680Ω	0Ω	.1Ω	10KΩ*	33KΩ*	680Ω	-	-
V 3	6C4	3.9KΩ*	INF.	.1Ω	0Ω	3.9KΩ*	26KΩ	3.9KΩ	-	-
V 4	6AH6	5 Meg.	0Ω	.1Ω	0Ω	4KΩ*	75KΩ*	150Ω	-	-
V 5	6AH6	.1Ω	0Ω	.1Ω	0Ω	4KΩ*	70KΩ*	150Ω	-	-
V 6	6AL5	1KΩ	2KΩ	.1Ω	0Ω	.2Ω	INF.	2.2 Meg.	-	-
V 7	6AU6	2KΩ	0Ω	.1Ω	0Ω	13KΩ*	90KΩ*	0Ω	-	-
V 8	6K6GT	INF.	.1Ω	10KΩ*	38KΩ*	450KΩ	INF.	0Ω	0Ω	-
V 9	6BA6	3.5 Meg.	0Ω	0Ω	.1Ω	4KΩ*	47KΩ*	70Ω	-	-
V 10	6BA6	3.5 Meg.	0Ω	0Ω	.1Ω	4KΩ*	50KΩ*	68Ω	-	-
V 11	6AL5	.1Ω	.1Ω	0Ω	.1Ω	110KΩ	0Ω	110KΩ	-	-
V 12	6AU6	1 Meg.	0Ω	0Ω	.1Ω	220KΩ*	800KΩ*	330Ω	-	-
V 13	6K6GT	.5Ω	.1Ω	4KΩ*	3.3KΩ*	470KΩ	INF.	0Ω	550Ω	-
V 14	6SL7GT	8 Meg.	110KΩ*	0Ω	2.2 Meg.	520KΩ*	1KΩ	0Ω	.1Ω	-
V 15	6SN7GT	4.7KΩ	65KΩ*	1KΩ	145KΩ	800KΩ* 250KΩ*	1KΩ	0Ω	.1Ω	-
V 16	6SN7GT	70KΩ	95Ω*	1KΩ	270KΩ	95Ω*	1KΩ	0Ω	.1Ω	-
V 17	6SN7GT	11KΩ	18KΩ*	1KΩ	470KΩ	350KΩ*	1KΩ	0Ω	.1Ω	-
V 18	6SN7GT	2.2 Meg	6 Meg.	68KΩ	4.7 Meg.	8 Meg.	68KΩ	0Ω	.1Ω	-
V 19	5U4	90KΩ	90KΩ	170KΩ	40Ω	INF.	40Ω	INF.	90KΩ	-
V 20	6V6GT	30Ω	.1Ω	200Ω*	10KΩ*	69KΩ	0Ω	0Ω	0Ω	-
V 21	1B3GT	INF.	10 Meg.	INF.	10 Meg.	INF.	INF.	10 Meg.	INF.	200Ω

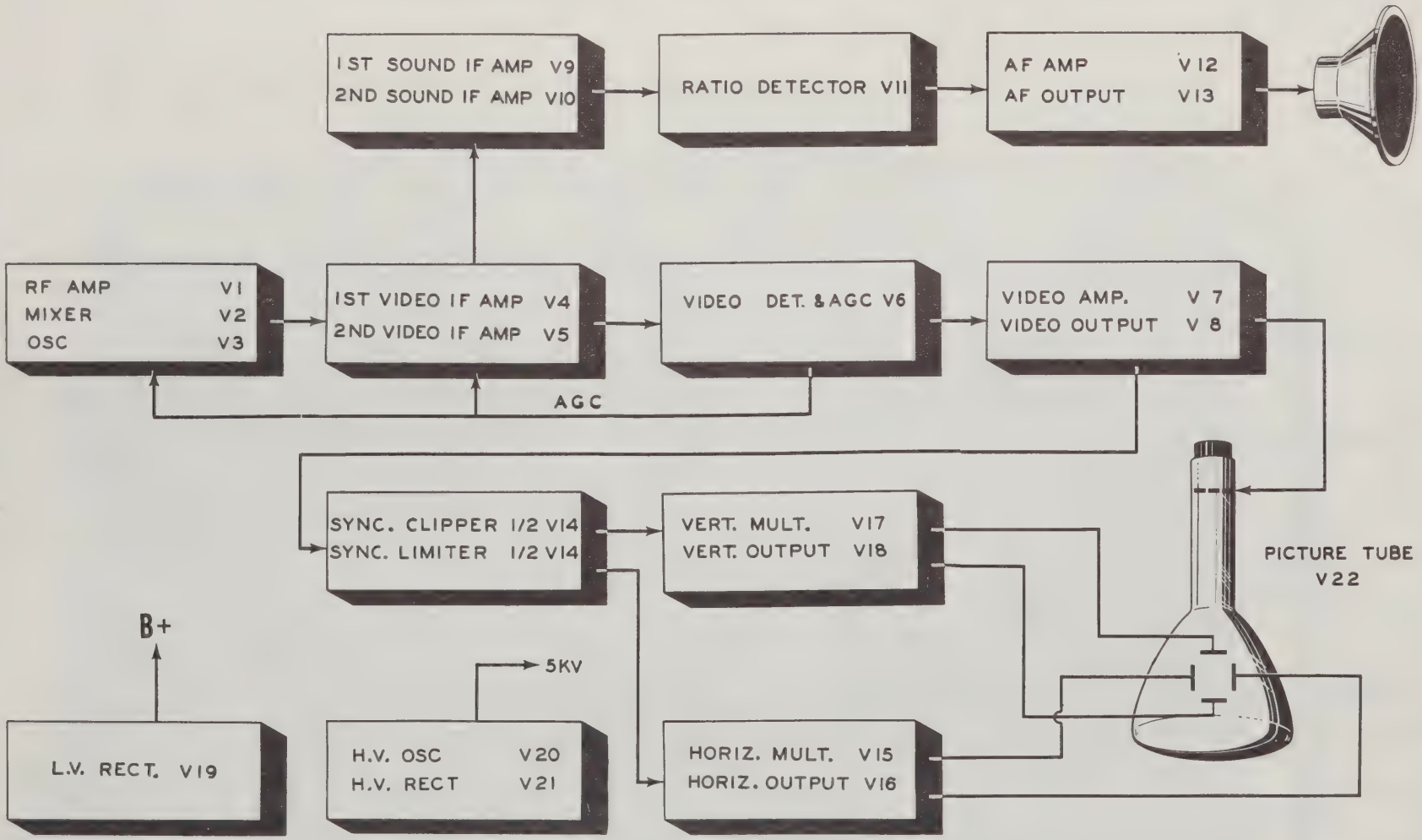
	PINS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V 22	7JP4 10HP4	0Ω	200KΩ	100KΩ	INF.	5 Meg.	INF.	10 Meg.	10 Meg.	10 Meg.	10 Meg.	10 Meg.	INF.	INF.	.1Ω

*MEASURED FROM PIN 2 5U4.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at maximum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

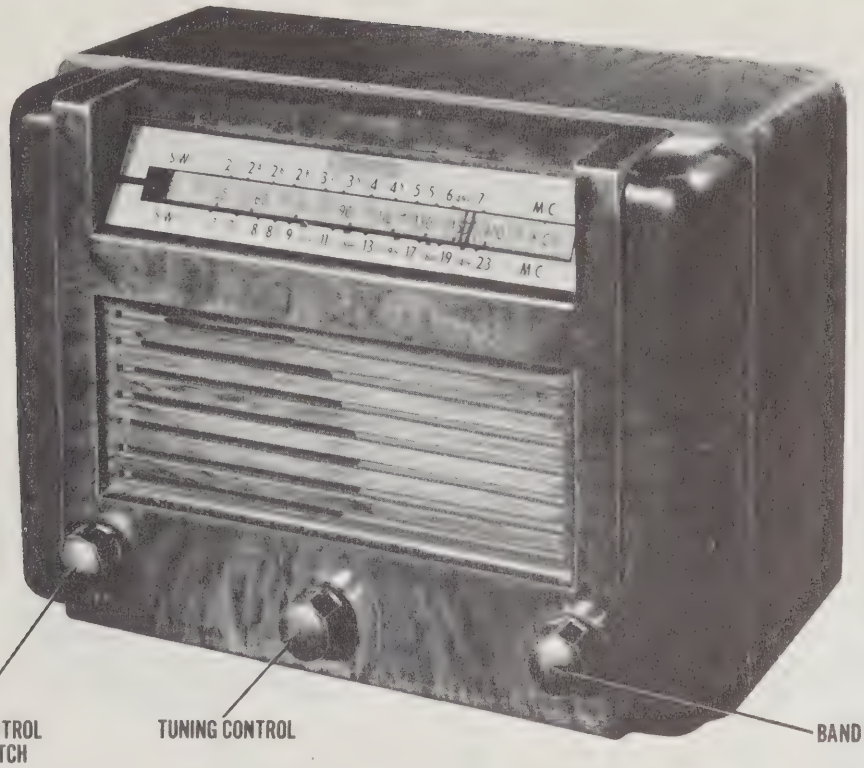


TUBE PLACEMENT CHART



BLOCK DIAGRAM

CONCORD
MODEL 1-504



CONCORD
MODEL 1-504

CONCORD MODEL 1-504

TRADE NAME	Concord, Model 1-504
SUPPLIER	Concord Radio Corp., 901-11 W. Jackson Blvd, Chicago, Ill.
TYPE SET	AC Operated Multi-Band Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 6BE6 Converter, 6BA6 IF Amp., 6AT6 Det.-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier.
POWER SUPPLY	110-120 or 230 Volts AC — RATING .33 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1720KC — BAND 1: 2.2-7.2MC, BAND 2: 6.9-23.5MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning cap. fully closed and set pointer 1-3/4" from left edge of dial backplate. This is the calibration mark referred to in the steps below.
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to front stator of tuning cap. Low side to chassis.	455KC	BC (Counter-clock-wise)	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output
2	200 MMF	High side to ant lead. Low side to chassis.	1500KC	"	4-1/8" from calibration mark	"	A5	" " " "
3	200 MMF	"	"	"	Tune for max-imum output.	"	A6	" " " "
4	200 MMF	"	600KC	"	27/32" from calibration mark.	"	A7,A8	Adjust for maximum output Repeat Steps 2, 3 & 4 until no further improvement can be made.
5	400Ω carbon res.	"	6MC	SW 1 (center)	4" from cali-bration mark	"	A9	Adjust for maximum output
6	"	"	"	"	Tune for max-imum output.	"	A10	Rock tuning cap. and adjust for maximum output.
7	"	"	2.5MC	"	"	"	A11	Rock tuning cap. and adjust for maximum output. Repeat Steps 5, 6 & 7 until no further improvement can be made.
8	"	"	21MC	SW 2 (clock-wise)	4-1/16" from calibration mark.	"	A12	Adjust for maximum output
9	"	"	"	"	Tune for max-imum output.	"	A13	Rock tuning cap. and adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

CONCORD MODEL 1-504

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	6BE6	6BE6	7CH	
2	IF Amp.	6BA6	6BA6	7BK	
3	Det.-AVC-AF	6AT6	6AT6	7BT	
4	Power Output	6AQ5	6AQ5	7BZ	
5	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CONCORD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	450		AF88J	UP4445	DY-2x40-450	EL-240	▲ Filter
B	40	450						▲ "
7	.02	600		684-02	GT6S2	ST-6-02	TC-12	Line Filter
8	.02	600		684-02	GT6S2	ST-6-02	TC-12	" "
9	.02	400		484-02	GT4S2	ST-4-02	TC-12	IF Screen Bypass
10	.02	400		484-02	GT4S2	ST-4-02	TC-12	Converter Screen Bypass
11	.02	200		484-02	GT2S2	ST-4-02	TC-12	AVC Filter
12	6800	500		684-0075	1D3D7	MW.3-27	1FM-27	Output Plate Bypass
13	6800	500		684-0075	1D3D7	MW.3-27	1FM-27	Audio Coupling
14	6800	500		684-0075	1D3D7	MW.3-27	1FM-27	" "
15	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass Pwr. Supply
16	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
17	4000	500		1467-004	1D5D4	MW.5-24	1FM-24	Fixed Padder
18	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	" "
19	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	RF Coupling
20	4300	500						Fixed Trimmer
21	6800	500		684-0075	1D3D7	MW.3-27	1FM-27	Ext. Ant. Coupling

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CONCORD PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	500KΩ	½		D13-133	M-60-Z	Volume Control
B	Shaft			A	Not Req.	Attach to 22A per instructions
C	Switch			41	SW-A	" " " " "

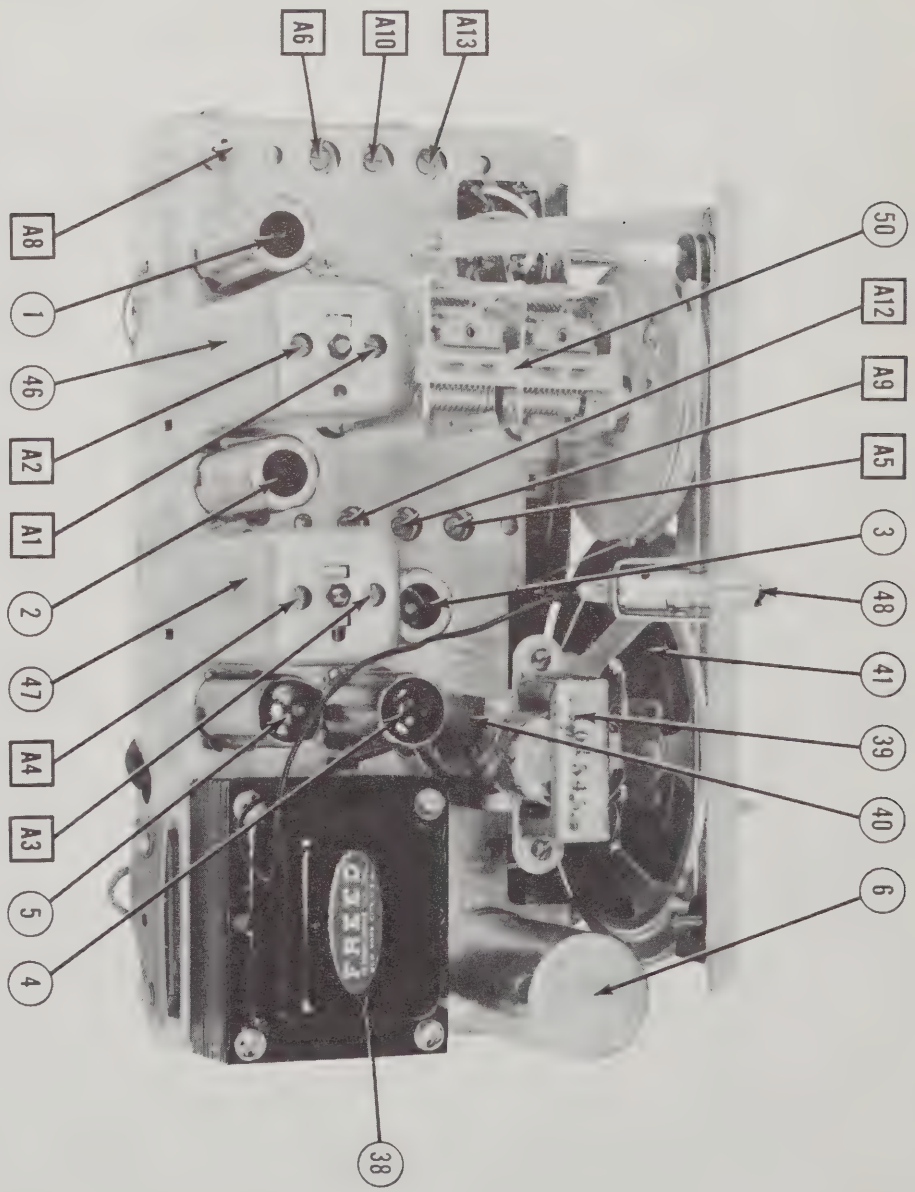
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CONCORD PART No.	IRC PART No.	IDENTIFICATION CODES
23	220KΩ	½		BTS-220K	Red-Red-Yl. Conv. Grid
24	10KΩ	½		BTS-10K	Br.-Blk.-Or. Conv. Screen
25	150Ω	½			Br.-Grn.-Br. Parasitic Suppressor
26	39Ω	½			Or.-White-Blk. " "
27	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
28	10KΩ	½		BTS-10K	Br.-Blk.-Or. SW Osc. Coil Shunt
29	150Ω	½		BW-½-150	Br.-Grn.-Br. IF Cathode
30	10KΩ	½		BTS-10K	Br.-Blk.-Or. IF Screen
31	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. AVC Network
32	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue AF Grid
33	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
34	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
35	270Ω	1		BW-1-270	Red-Vi.-Br. Output Cathode
36	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter
37	150Ω	½		BW-½-150	Br.-Grn.-Br. Surge Limiter

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CONCORD PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
38	230V AC tapped @ 117V AC @.33A	450V CT .058ADC	6.3V AC @ 2.0A					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		CONCORD PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
39	2650Ω	3.2Ω	230Ω	.3Ω		A-3876	T22845	A-2928	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			CONCORD PART No.	JENSEN PART No.	QUAM PART No.	
40	FIELD	VC IMP.		ST-105		
	PM	3.2Ω		Mod. P5-X	5A07	
41	CONE DIA.	VC DIA.				
	4-13/16"	9/16"				

R F COILS

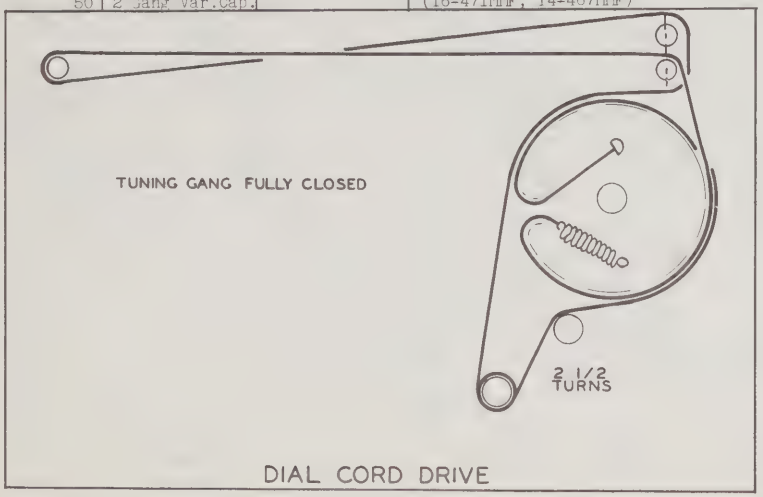
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	CONCORD PART No.	MEISSNER PART No.	
42	BC Ant.Coil		2.2Ω			
43A	SW1 " "	0Ω	0Ω			
B	SW2 " "	0Ω	0Ω			
44A	BC Osc.Coil		6Ω			
B	SW1 " "		2Ω			
45	SW2 " "		0Ω			
46	Input IF	21Ω	21Ω		16-6658	
47	Output IF	11Ω			16-6670	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					CONCORD PART No.		
48	Bayonet	6-8	0.15	Brown			Type #47

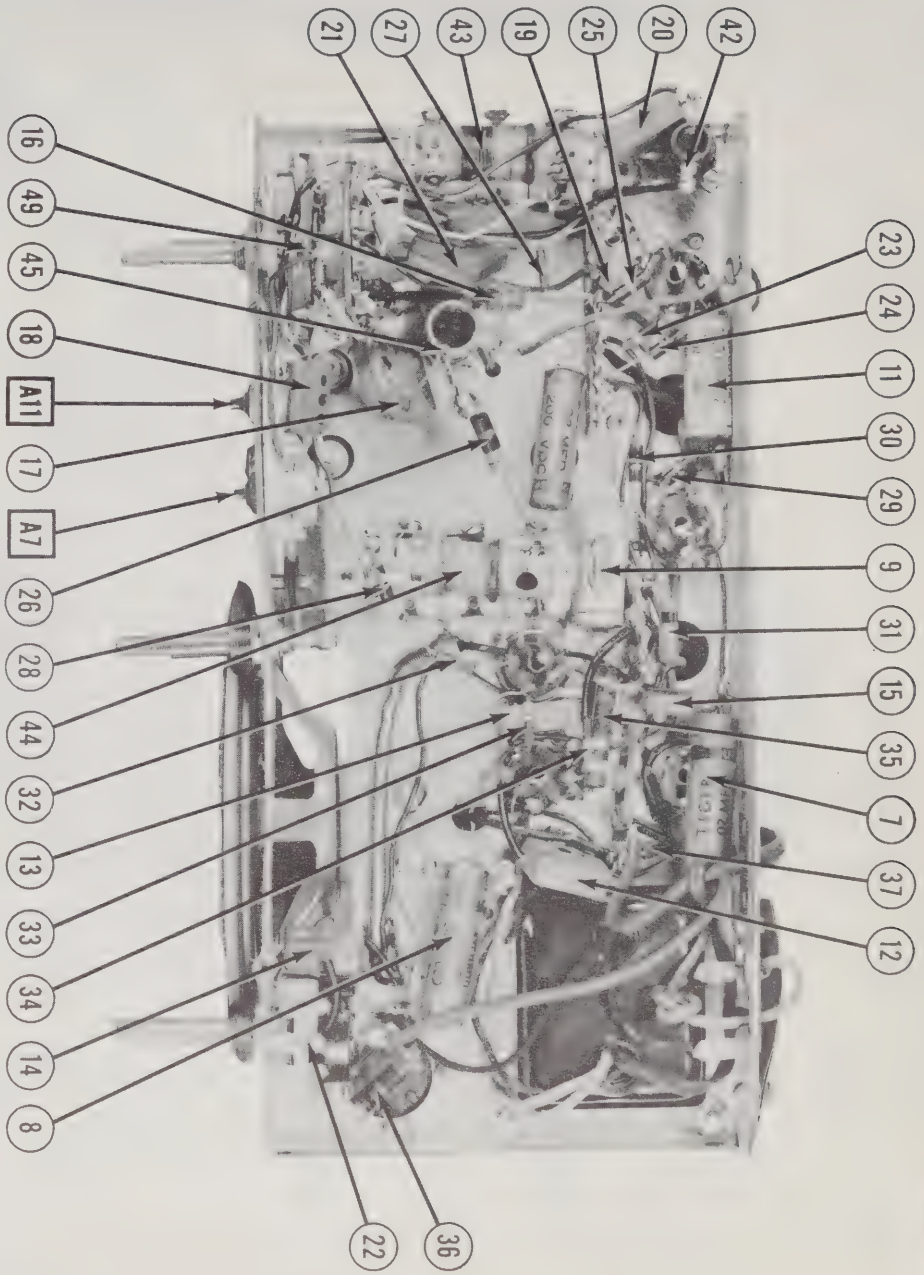
MISCELLANEOUS

ITEM No.	PART NAME	CONCORD PART No.	NOTES
49	Switch		Band
50	2 Gang Var.Cap.		(16-471MMF, 14-467MMF)

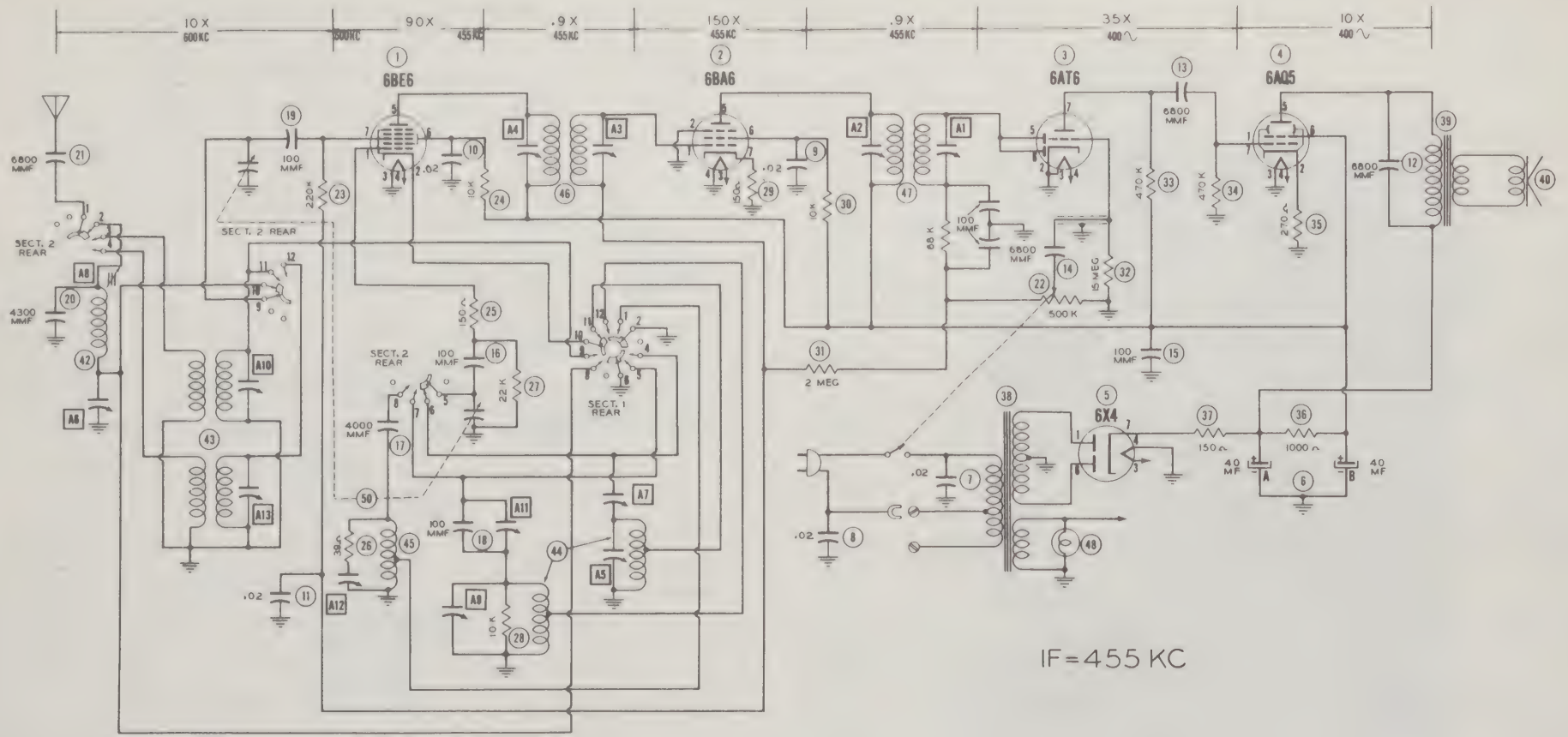


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



CONCORD MODEL 1-504



VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	6BE6	-.7VDC§	0V.	0V.	6.3VAC	190VDC	115VDC	0V.
2	6BA6	0V.	0V.	0V.	6.3VAC	190VDC	145VDC	2.7VDC
3	6AT6	-.1VDC	0V.	0V.	6.3VAC	-.2VDC	-.2VDC	0 VDC
4	6AQ5	0V.	6.4VDC	6.3VAC	0V.	21.1VDC	190VDC	0V.
5	6X4	325VAC	0V.	0V.	6.3VAC	0V.	325VAC	350VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	6BE6	47KΩ	0Ω	0Ω	.1Ω	150KΩ	160KΩ	2.7 Meg.
2	6BA6	2.5 Meg.	0Ω	0Ω	.1Ω	150KΩ	160KΩ	150Ω
3	6AT6	1.5 Meg.	0Ω	0Ω	.1Ω	550KΩ	550KΩ	620KΩ
4	6AQ5	470KΩ	470Ω	.1Ω	0Ω	150KΩ	150KΩ	470KΩ
5	6X4	130Ω	INF.	0Ω	.1Ω	INF.	120Ω	150KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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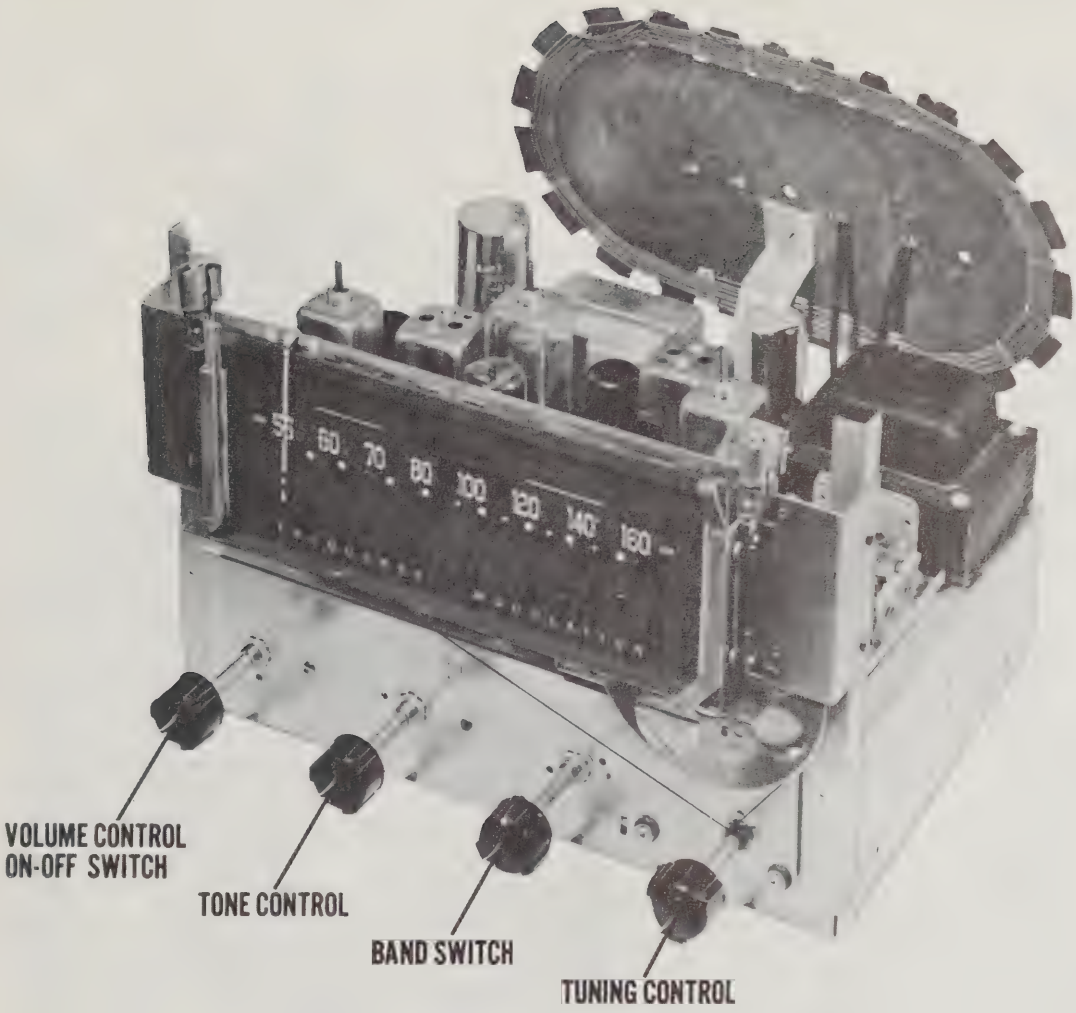
493-6

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

CONCORD
MODEL 1-1201



CONCORD
MODEL 1-1201

CONCORD MODEL 1-1201

TRADE NAME	Concord, Model 1-1201
SUPPLIER	Concord Radio Corp., 901-11 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (TWELVE)	Types, 6BA6 FM RF Amp., 6SK7 AM RF Amp., 6BE6 FM Converter, 6SA7 AM Conv., 6SK7 1st IF Amp., 6SH7 FM 2nd IF Amp., 6AL5 FM Detector, 6SQ7 AM Det.-AVC-Phase Inv., 6SQ7 1st AF Amp., (2) 6K6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts AC — RATING .58 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC — FREQ. MOD. 88 - 108MC

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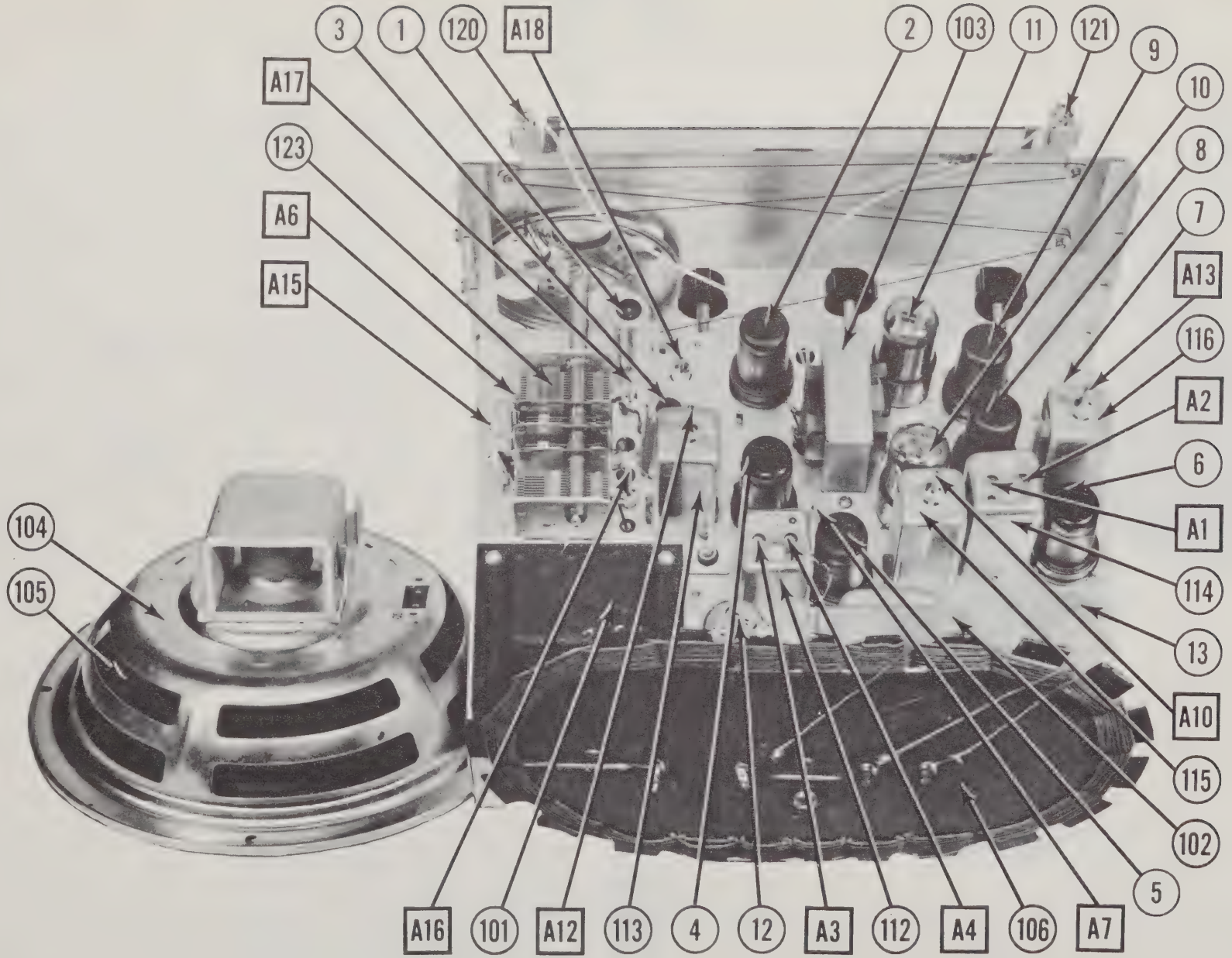
DATE 2/49-#493-7 SET #493-7


3
1
120
A18
2
103
11
121
9
10
A17
8
123
7
A6
A13
A15
116
A2
6
A1
104
114
105
13
A10
115
102
5
A16
101
A12
113
4
12
A3
112
A4
106
A7

A8
A9
A11
A
B

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM RF Amp.	6BA6	6BA6		
2	AM RF Amp.	6SK7	6SK7		
3	FM Converter	6BE6	6BE6		
4	AM Converter	6BA7	6BA7		
5	1st IF Amp.	6SK7	6SK7		
6	FM 2nd IF	6SH7	6SH7		
7	FM Detector	6AL5	6AL5		
8	AM Det.-AVC-Phase Inv.	6SQ7	6SQ7		
9	1st AF Amp.	6SQ7	6SQ7		
10	Power Output	6K6GT	6K6GT		
11	" "	6K6GT	6K6GT		
12	Rectifier	5Y3GT	5Y3GT		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CONCORD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
13A	40	450		AF88J	UP4445	DY-2x40-450	EL-240	▲ Filter
B	40	450						● "
14	50	50		PRS50/50	BR505	M-50-50	TA-550	Output Cathode Bypass
15	8	100		PRS150/8	BR815	M-8-150	UT-81	Stabilizing Cap.
16	.01	600		684-01	GT6S1	ST-6-01	TC-11	Line Filter
17	.05	400		454-05	GT4S5	ST-4-05	TC-15	RF Bypass Power Supply
18	.01	400		484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
19	.01	400		484-01	GT4S1	ST-4-01	TC-11	" "
20	.02	400		484-02	GT4S2	ST-4-02	TC-12	" "
21	.0015	400		484-002	GT6D2	ST-6-002	TC-22	" "
22	.0015	400		484-002	GT6D2	ST-6-002	TC-22	Tone Compensation
23	.01	400		484-01	GT4S1	ST-4-01	TC-11	" "
24	.01	400		484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
25	.002	400		484-002	GT6D2	ST-6-002	TC-22	De-emphasis
26	.01	400		484-01	GT4S1	ST-4-01	TC-11	2nd IF Plate Decoup.
27	.0015	400		484-002	GT6D2	ST-6-002	TC-22	2nd IF Screen Bypass
28	.01	400		484-01	GT4S1	ST-4-01	TC-11	2nd IF Cathode Bypass
29	.01	400		484-01	GT4S1	ST-4-01	TC-11	2nd IF Screen Bypass
30	.01	400		484-01	GT4S1	ST-4-01	TC-11	RF Bypass Power Supply
31	.01	400		484-01	GT4S1	ST-4-01	TC-11	Decoupling
32	.01	400		484-01	GT4S1	ST-4-01	TC-11	AVC Filter
33	.01	400		484-01	GT4S1	ST-4-01	TC-11	" "
34	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	Output Plate Bypass
35	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
36	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	Phono Feedback -Cer.
37	330	300		1468-00035	5W5T3	MO.5-33	1FM-335	FM Det. Diode Load " See Note ●
38	330	300		1468-00035	5W5T3	MO.5-33	1FM-335	●
39	330	300		1468-00035	5W5T3	MO.5-33	1FM-335	RF Bypass "
40	100	500		1469-0001	5R5T1	MOS.5-31	MS-31	RF Diode Filter
41	100	500		1469-0001	5R5T1	MOS.5-31	MS-31	" " "
42	330	300		1468-00035	5W5T3	MO.5-33	1FM-335	1st IF Cath. Byp. "
43	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
44	1500	300		1467-0015	1W5D15	MW.5-215	1FM-215	FM Conv. Plate Decoup.-Cer.
45	330	300		1468-00035	5W5T3	MO.5-33	1FM-335	FM Conv. Screen Byp.-Cer.
46	50	300		1469-00005	5W5Q5	MO.5-45	1FM-45	Fixed Padder "
47	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap. "
48	90	300						Fixed Padder "
49	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	RF Coupling "
50	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	" "
51	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	RF Screen Bypass
52	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	RF Cathode Bypass
53	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	Filament Bypass "

Note-When either Item 37 or 38 are replaced, replace both with capacitors of equal value.

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: CONCORD PART NO.	REPLACEMENT DATA: STANCOR PART NO.	REPLACEMENT DATA: THORDARSON PART NO.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
102	.06A	215Ω	6.5 Henries		C-1002	T20C53#	C-2990	#Drill one new mounting hole.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
103	3700Ω CT	3.5Ω	255Ω CT	.5Ω		A-3870	T22S58	A-2935	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
104	FIELD PM	VC IMP. 3.5Ω		ST-120† Mod. P10-S	10A31	†Replace output transformer to match 6-dΩ voice coil.
105	CONE DIA. 9-5/8"	VC DIA. 1"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA: MEISSNER PART No.
106	AM Loop Ant.	0Ω	1.2Ω		
107	FM Dipole Ant.		0Ω		
108	FM Ant.Coil	0Ω	.1Ω		
109	FM RF Coil		0Ω		
110	AM Osc.Coil		5.5Ω		14-1060
111	FM " "		0Ω		
112	AM 1st IF	20Ω	19.5Ω		16-6658
113	FM 1st IF	.2Ω	.2Ω		
114	AM 2nd IF	20Ω	20Ω		16-6660
115	FM 2nd IF	.2Ω	.2Ω		
116	Ratio Det.	1Ω	.2Ω		
117	RF Plate Choke		.5Ω		
118	Fil. Choke		.5Ω		
119	" "		.5Ω		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: CONCORD PART No.	REPLACEMENT DATA	INSTALLATION NOTES
120	Bayonet	6-8	0.15	Brown			Type 41
121	"	"	"	"			" "

MISCELLANEOUS

ITEM No.	PART NAME	CONCORD PART No.	NOTES
122	Switch		Band-Phono
123	2 Gang Var. Cap.		(21-492MMF, 32-202MMF)

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	CONCORD PART No.	IRC PART No.	CLAROSTAT PART No.	
54A	500KΩ	½		D18-133X	T-88	Volume Control tapped @ 50KΩ
B	Shaft			A	Not Req.	Attach to 54A per instructions
C	Switch			41	SW-A	" " " " "
55A	250KΩ	½		D13-130	M-64-Z	Tone Control
B	Shaft			A	Not Req.	Attach to 55A per instructions

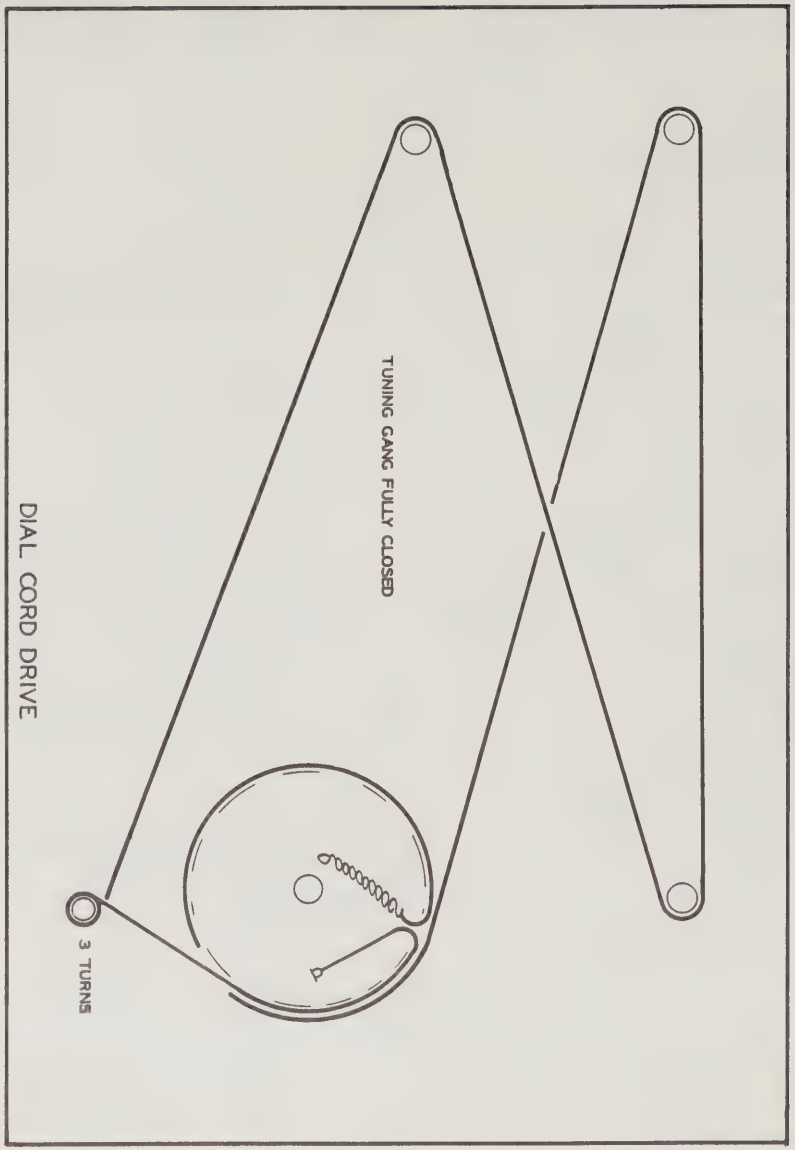
RESISTORS

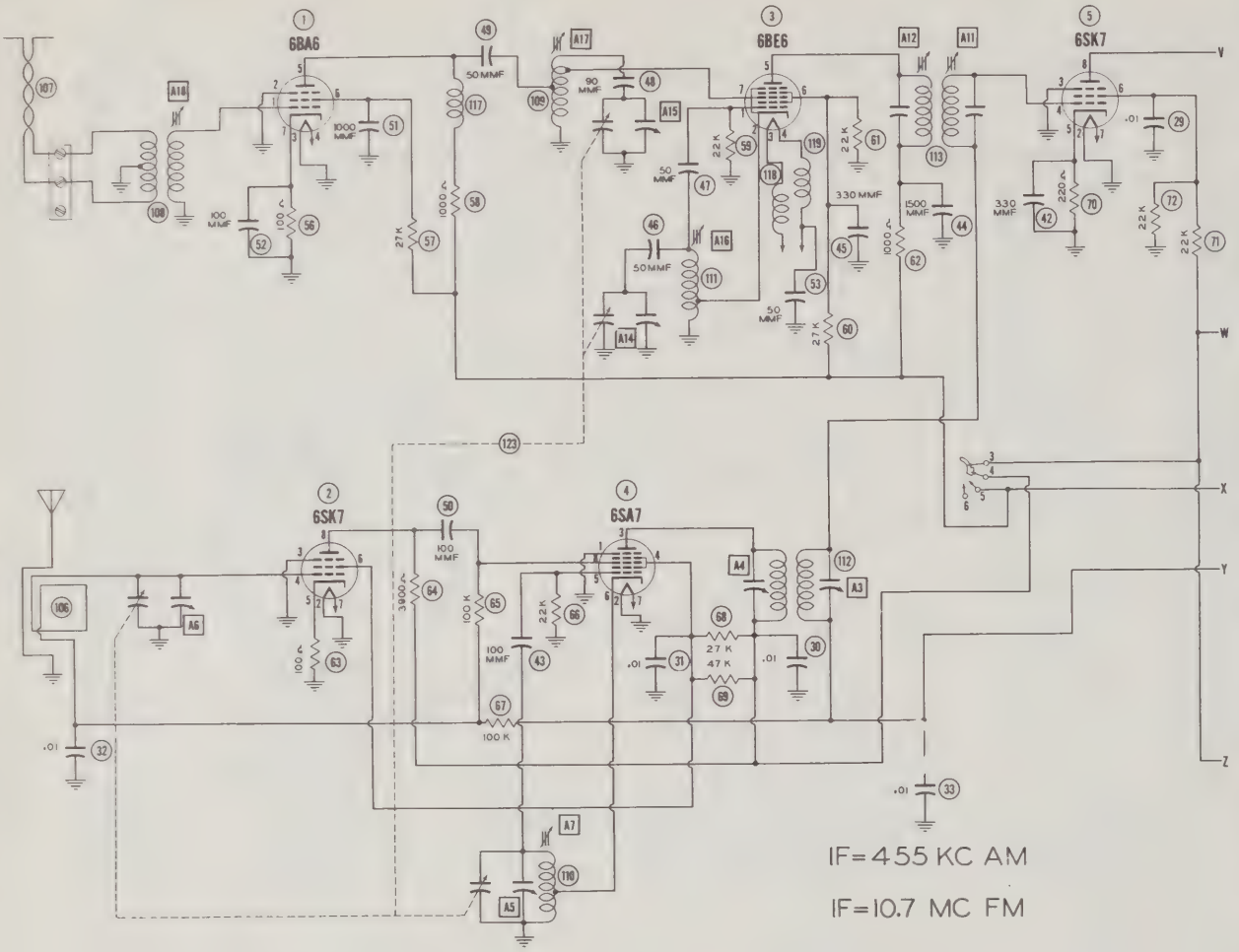
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	CONCORD PART No.	IRC PART No.	
56	100Ω	½			Br.-Blk.-Br. FM RF Cathode
57	27KΩ	2		BT-2-27K	Red-Vi.-Or. FM RF Screen
58	1000Ω	½		BTS-1000	Br.-Blk.-Red FM RF Plate
59	22KΩ	½		BTS-22K	Red-Red-Or. FM Osc. Grid
60	27KΩ	2		BT-2-27K	Red-Vi.-Or. FM Conv. Screen Dropping
61	22KΩ	½		BTS-22K	Red-Red-Or. FM Conv. Screen Bleeder
62	1000Ω	½		BTS-1000	Br.-Blk.-Red FM Conv. Plate Decoup.
63	100Ω	½			Br.-Blk.-Br. AM RF Cathode
64	3900Ω	2		BT-2-3900	Or.-White-Red AM RF Plate Load
65	100KΩ	½		BTS-100K	Br.-Blk.-Yl. AM Conv. Grid
66	22KΩ	½		BTS-22K	Red-Red-Or. AM Osc. Grid
67	100KΩ	½		BTS-100K	Br.-Blk.-Yl. AVC Network
68	27KΩ	2		BT-2-27K	Red-Vi.-Or. Screen Dropping
69	47KΩ	1		BTA-47K	Yl.-Vi.-Or. " "
70	220Ω	½			Red-Red-Br. 1st IF Cathode
71	22KΩ	1		BTA-22K	Red-Red-Or. 1st IF Screen Dropping
72	22KΩ	½		BTS-22K	Red-Red-Or. 1st IF Screen Bleeder
73	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Diode Filter
74	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Diode Load
75	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
76	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. " "
77	220KΩ	½		BTS-220K	Red-Red-Yl. Tone Compensation
78	100Ω	½			Br.-Blk.-Br. 2nd IF Cathode
79	33KΩ	1		BTA-33K	Or.-Or.-Or. 2nd IF Screen
80	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling
81	82Ω	½			Gray-Red-Blk. RF Filter
82	22KΩ	½		BTS-22K	Red-Red-Or. De-emphasis
83	680Ω	½		BTS-680	Blue-Gray-Br. Balancing Res.
84	1000Ω	½		BTS-1000	Br.-Blk.-Red " "
85	6800Ω	½		BTS-6800	Blue-Gray-Red Ratio Det. Diode Load
86	6800Ω	½		BTS-6800	Blue-Gray-Red " " " "
87	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Tone Compensation
88	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
89	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load
90	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue Phase Inv. Grid
91	220KΩ	½		BTS-220K	Red-Red-Yl. Phase Inv. Plate Load
92	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
93	220KΩ	½		BTS-220K	Red-Red-Yl. " "
94	220KΩ	½		BTS-220K	Red-Red-Yl. " "
95	330Ω 1	½		BW-1-330	Or.-Or.-Br. Output Cathode
96	330Ω	1		BW-1-330	Or.-Or.-Br. Output Cathode
97	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Series Phono
98	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Tone Compensation
99	150Ω	½		BW-½-150	Br.-Grn.-Br. " "
100	510Ω	½		BTS-560	Grn.-Br.-Br. " "

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	CONCORD PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
101	117VAC @ .58A	560VCT .09ADC	4.9VAC @ 2.0A	6.2VAC @ 3.6A		P-6013*	T22R05	P-2953*

*Add series resistor to reduce plate voltage.





VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡ 1	6BA6	0V.	0V.	0V.	-.2VAC	240VDC	110VDC	1.6VDC	–
2	6SK7	0V.	0V.	0V.	-.4VDC	1.4VDC	1.4VDC	6.2VAC	250VDC
‡ 3	6BE6	-.4VDC	0V.	0V.	-.2VAC	6.8VDC	65VDC	0V.	–
4	6SA7	0V.	0V.	240VDC	1.4VDC	-.4VDC	0V.	6.2VAC	–
5	6SK7	0V.	0V.	0V.	-.2VDC	6.8VDC	110VDC	6.2VAC	285VDC
‡ 6	6SH7	0V.	0V.	1.8VDC	0V.	1.8VDC	150VDC	6.2VAC	260VDC
‡ 7	6AL5	.75V.	-.4VDC	6.2VAC	0V.	0V.	0V.	0V.	–
8	6BQ7	0V.	-.4VDC	0V.	-.2VDC	-.4VDC	125VDC	0V.	6.2VAC
9	6BQ7	0V.	-.4VDC	0V.	0V.	0V.	125VDC	0V.	6.2VAC
10	6BX7	0V.	0V.	6.2VAC	250VDC	0V.	-.5VDC	6.2VAC	250VDC
11	6X4	0V.	0V.	290VDC	290VDC	0V.	0V.	-.4VAC	265VDC
12	6Y6G	0V.	290VDC	0V.	290VDC	0V.	265VAC	0V.	290VDC

‡TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡ 1	6BA6	0Ω	0Ω	0Ω	.1Ω	.61KΩ	.7KΩ	1KΩ	–
2	6SK7	0Ω	0Ω	0Ω	500KΩ	100Ω	50KΩ	.1Ω	4KΩ
‡ 3	6BE6	25KΩ	0Ω	0Ω	.1Ω	.61KΩ	1KΩ	0Ω	–
4	6SA7	0Ω	0Ω	36KΩ	50KΩ	22KΩ	1Ω	.1Ω	7.5KΩ
5	6SK7	0Ω	0Ω	0Ω	500KΩ	240Ω	20KΩ	.1Ω	6KΩ
‡ 6	6SH7	0Ω	0Ω	100Ω	2Ω	100Ω	68KΩ	.1Ω	6KΩ
‡ 7	6AL5	7.5KΩ	7.5KΩ	.1Ω	0Ω	INF.	0Ω	INF.	–
8	6BQ7	0Ω	1½ Meg.	0Ω	540KΩ	510KΩ	.25KΩ	1Ω	.1Ω
9	6BQ7	0Ω	1½ Meg.	0Ω	0Ω	0Ω	.25KΩ	0Ω	.1Ω
10	6BX7	1MΩ	0Ω	34KΩ	34KΩ	100KΩ	50KΩ	.1Ω	450Ω
11	6X4	480KΩ	0Ω	36KΩ	36KΩ	50KΩ	INF.	.1Ω	50Ω
12	6Y6G	INF.	34KΩ	INF.	1.2KΩ	INF.	.6Ω	INF.	34KΩ

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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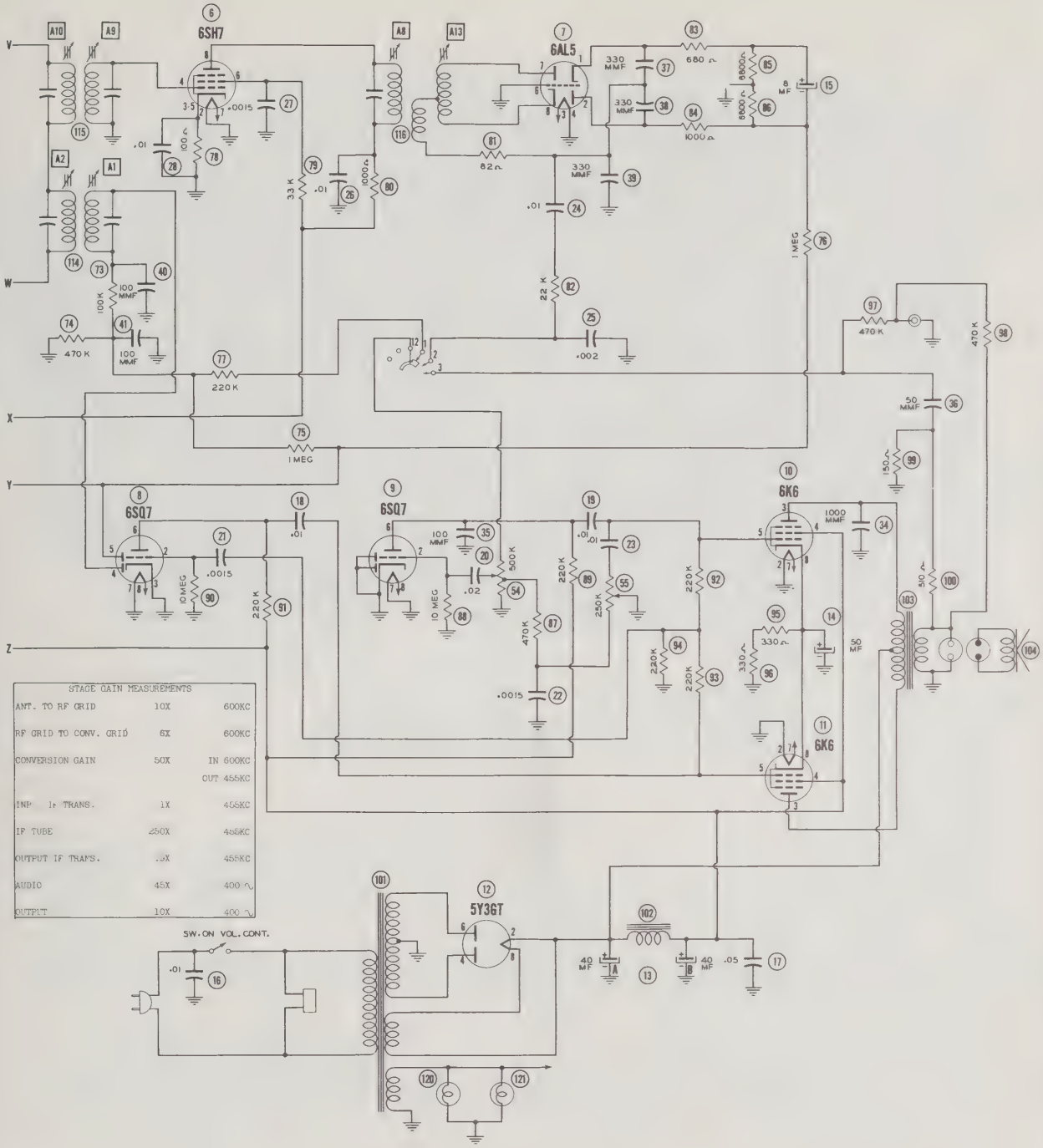

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

Use insulated alignment screwdriver for all adjustments.

AM ALIGNMENT

Volume control should be set at maximum volume. Output of signal generator should be no more than necessary to obtain a satisfactory output reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD	High side to Pin 8 (grid) of 6SA7. Low side to chassis.	455KC	Fully counter-clock-wise	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	"	Tune for maximum output.	"	A6	Adjust for maximum output.
4		"	600KC	"	"	"	A7	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 & 4 until no further improvement can be made.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5	.01 MFD.	High side to Pin 4 (grid) of 6SK7 1st FM IF Tube (5). Low side to chassis.	10.7MC (Freq. Mod.)	FM (Center position)	Tuning cap. fully open.	Vertical input to Point (A). Ground to chassis.	A8,A9, A10	Disconnect 8 MFD capacitor from Point (A). Adjust A8, A9 and A10 for maximum amplitude, symmetry and coincidence of pattern as per Fig.1.
6	.01 MFD	High side to Pin 7 (grid) of 6BE6. Low side to chassis.	"	"	"	"	A11, A12	Adjust for maximum amplitude, symmetry and coincidence of pattern as per Fig. 1. Reconnect 8 MFD capacitor to Point (A).
7	.01 MFD	High side to Pin 4 (grid) of 6SK7, 1st FM IF Tube (5). Low side to chassis.	"	"	"	Vertical input to Point (B). Ground to chassis.	A13	Adjust for maximum straightness of crossover lines with crossover at center of pattern per Fig. 2. Cont. with FM RF Alignment in Step 9.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5	.01 MFD	High side to Pin 4 (grid) of 6SH7. Low side to chassis.	10.7MC (Unmodulated)	FM (Center position)	Tuning cap. fully open.	DC probe to Point (A). Common to chassis.	A8	Adjust for maximum deflection.
6	.01 MFD	High side to Pin 4 (grid) of 6SK7 1st FM IF Tube (5). Low side to chassis.	"	"	"	"	A9,A10	" " " "
7	.01 MFD	High side to Pin 7 (grid) of 6BE6. Low side to chassis.	"	"	"	"	A11, A12	" " " "
8	.01 MFD	High side to Pin 4 (grid) of 6SH7. Low side to chassis.	"	"	"	"	A13	Adjust for zero deflection. Continue with FM RF Alignment.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9	2 -150Ω carbon res.	Each side in series with 150Ω carbon resistor and connect to FM antenna terminals.	108MC	FM (center position)	108MC	DC probe to Point (A). Common to chassis.	A14, A15	Adjust for maximum deflection.
10	"	"	92MC	"	92MC	"	A16, A17	Rock tuning cap. and adjust for maximum deflec. Repeat Steps 9 & 10 until no further improvement can be made.
11	"	"	98MC	"	Tune for maximum deflec.	"	A18	Rock tuning cap. and adjust for maximum deflection.

FIG. 1

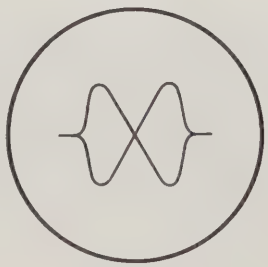
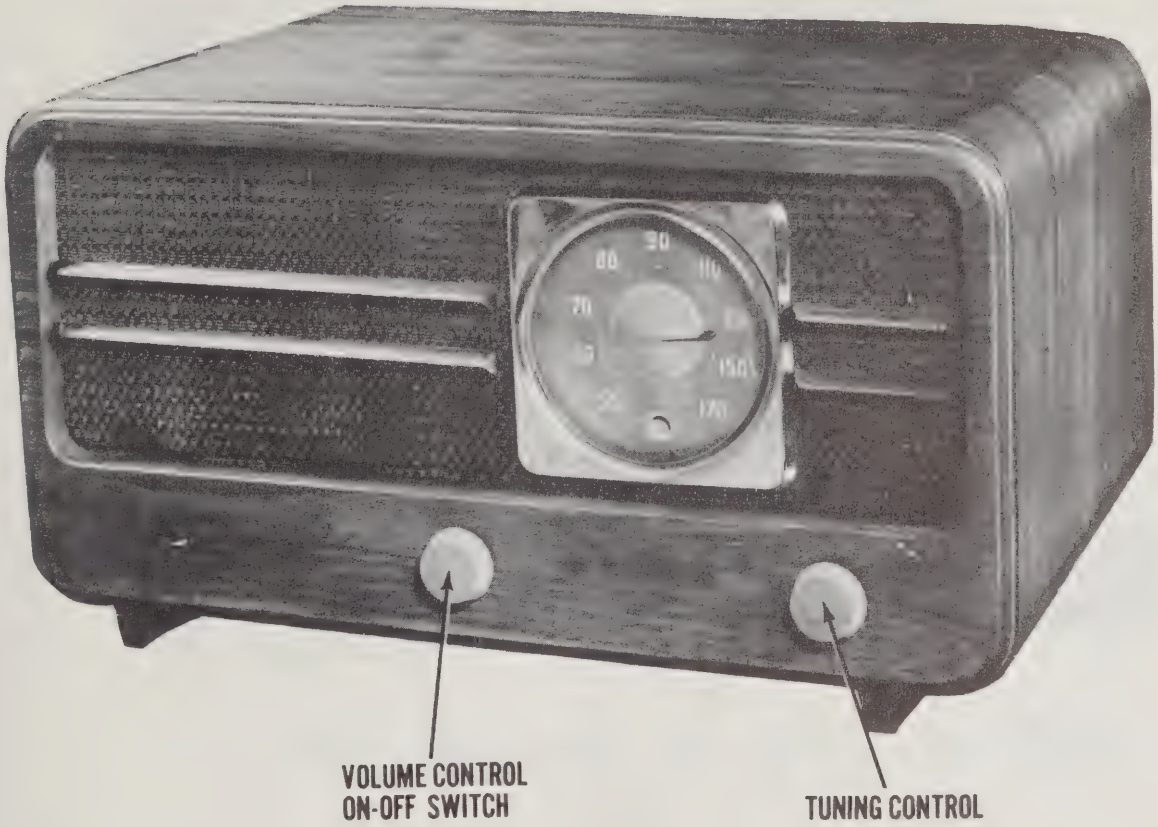


FIG. 2

DETROLA MODEL 610-A
BATTERY-OPERATED



DETROLA MODEL 610-A
BATTERY-OPERATED

DETROLA MODEL 610-A

TRADE NAME	Detrola, Model 610-A
MANUFACTURER	International Detrola Corp., 1501 Beard St., Detroit, Michigan
TYPE SET	Battery Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 1A7GT Converter, 1N5GT IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output
POWER SUPPLY	1.5 Volts "A" Supply and 90 Volts "B" Supply in Pack Form
RATING	260MA @ 1.5 Volts DC and 15 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1710KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD.	High side to grid cap. of 1N5GT (IF Tube). Low side to chassis.	455KC	550KC	Across voice coil	A1,A2	Adjust for maximum output.
2	.05 MFD	High side to grid cap. of 1A7GT. Low side to chassis.	"	"	"	A3,A4	" " " "
3	200MMFD	High side to ant. terminal. Low side to chassis.	1500KC	1500KC	"	A5,A6	" " " "

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DATE 2/49-#493-8 SET #55-FOLDER #8

PARTS LIST AND DESCRIPTIONS

DETROLA MODEL 610-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DETROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1A7GT	1A7GT	7Z	
2	IF Amp.	1N5GT	1N5GT	5Y	
3	Det.-AVC-AF	1H5GT	1H5GT	5Z	
4	Power Output	3Q5GT	3Q5GT	7AP	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DETROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5	8	150	A-51300	PRS150/8	BR815	M-8-150	UT-81	Power Supply Bypass
6	.05	600	BD410503	P488-05	GT4S5	ST-4-05	TM-14	" " "
7	.002	500	BD610502	P688-003	GT6D3	ST-6-003	TM-23	Output Plate Bypass
8	.005	600	BD610502	P688-005	GT6D5	ST-6-005	TM-25	Audio Coupling
9	.005	600	BD610502	P688-005	GT6D5	ST-6-005	TM-25	" "
10	.01	600		P688-01	GT6S1	ST-6-01	TM-11	" "
11	.05	200	BD210503	P288-05	GT2S5	ST-4-05	TM-15	IF Grid Filter
12	.05	200	BD210503	P288-05	GT2S5	ST-4-05	TM-15	Conv. Screen Bypass
13	.05	200	BD210503	P288-05	GT2S5	ST-4-05	TM-15	AVC Filter
14	100	50	BM78A101	1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
15	100	300	BM78A101	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
16	4.7		B-51839-6	1468-000005	5W5V5	MO.5-55	MS-55	RF Coupling

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DETROLA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	2 Meg.	1		D13-139	AM-66-Z	Volume Control
B	Shaft			E	KSS-3	Attach to 17A per instructions
C	Switch			42	SW-A2	" " " " "

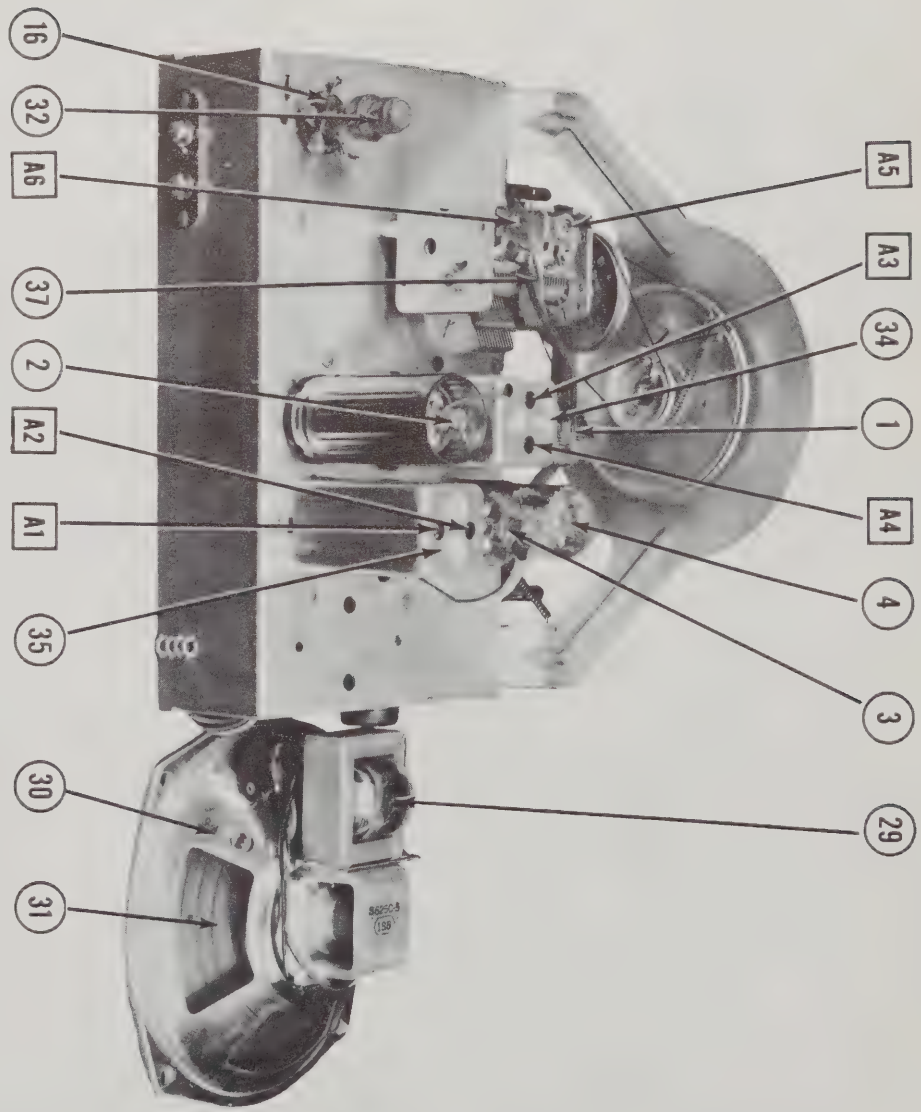
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DETROLA PART No.	IRC PART No.	IDENTIFICATION CODES
18	10KΩ	½	BR17B103	BTS-10K	Br.-Blk.-Or. Ant. Shunt
19	3.3 Meg.	½	BR17B335	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
20	220KΩ	½	BR17B224	BTS-220K	Red-Red-Yl. Oscillator Grid
21	4700Ω	½		BTS-4700	Yl.-Vi.-Red " "
22	47KΩ	½	BR17B473	BTS-47K	Yl.-Vi.-Or. Converter Screen Dropping
23	4.7 Meg.	½	BR17B475	BTS-4.7 Meg.	Yl.-Vi.-Grn. IF Grid
24	470KΩ	½	BR17B474	BTS-470K	Yl.-Vi.-Yl. Diode Load
25	10 Meg.	½	BR17B106	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
26	1 Meg.	½	BR17B105	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
27	1 Meg.	½	BR17B105	BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
28	330Ω	½	BR17B331	BW-½-330	Or.-Or.-Or. Bias

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DETROLA PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	INSTALLATION NOTES
29	7000Ω	3.7Ω	880Ω	.55Ω		A-3878	T22947	A-2931	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			DETROLA PART No.	JENSEN PART No.	QUAM PART No.	
30	FIELD RES. / PM	VC IMP. / 3.7Ω	C-51982	ST-108 Mod. P6-X	6A15	
31	CONE DIA. / 6"	VC DIA. / 9/16"				

R F COILS

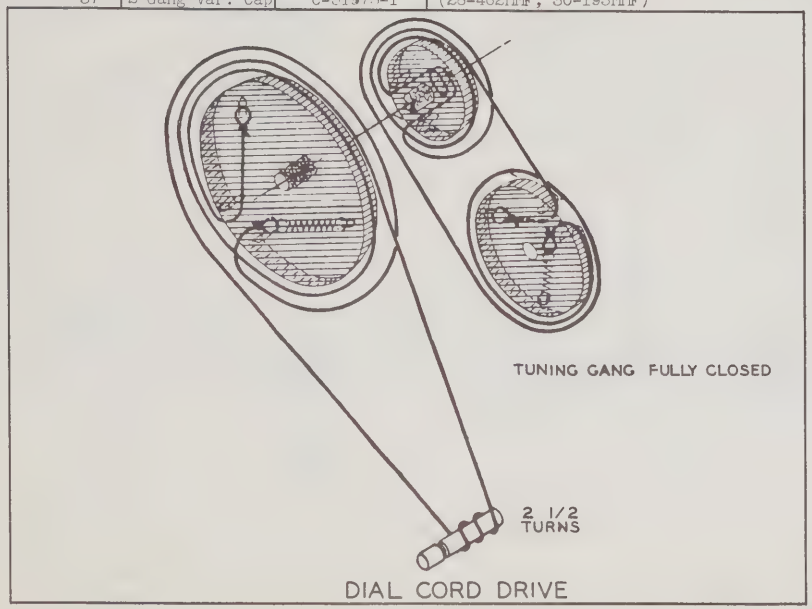
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	DETROLA PART No.	MEISSNER PART No.	
32	Ant. Coil	46Ω	3Ω	B-51900	14-1026	
33	Osc. Coil	23Ω	5.5Ω	B-51901	14-1040	
34	Input IF	13.5Ω	14Ω	B-51917-1	16-6658	
35	Output IF	14Ω		B-51908-1	16-6670	

BATTERIES

ITEM No.	VOLTAGE	DETROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
36	1.5V "A" 90V "B"				#758			17GD60	

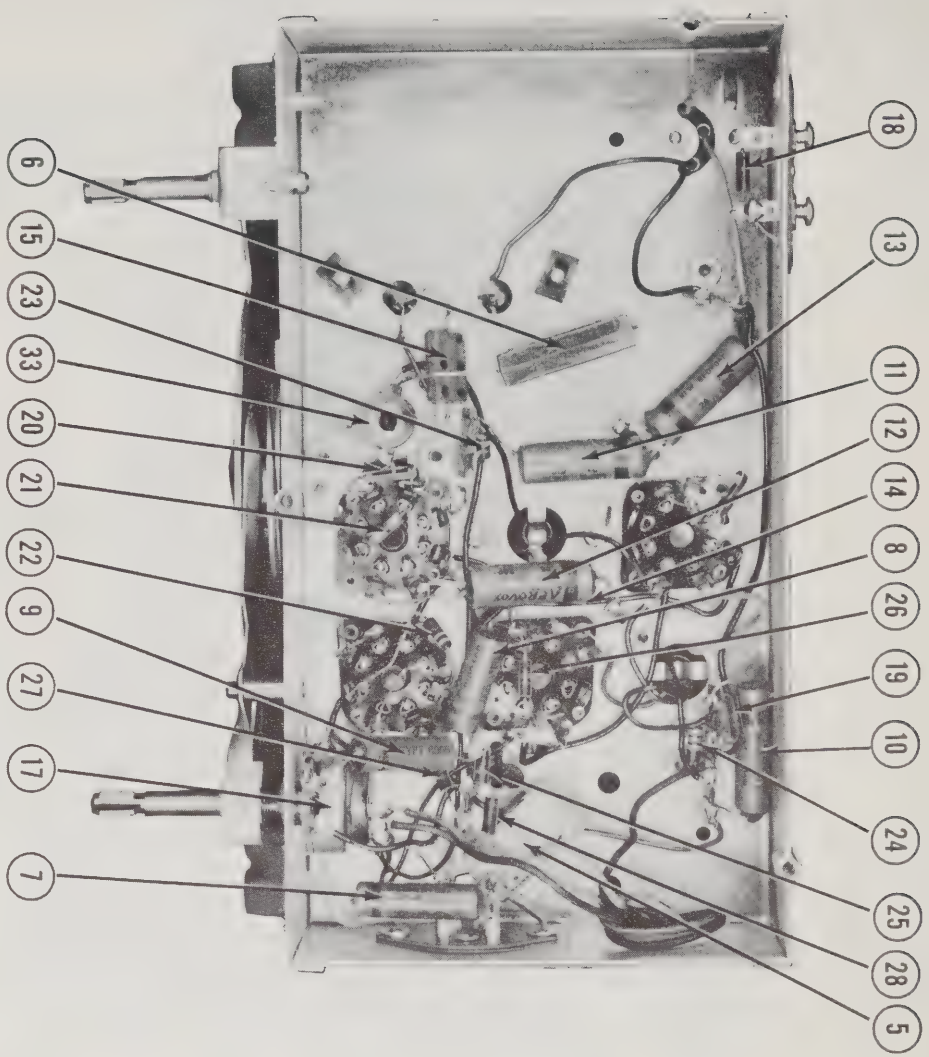
MISCELLANEOUS

ITEM No.	PART NAME	DETROLA PART No.	NOTES
37	2 Gang Var. Cap	C-51975-1	(28-462MMF, 30-195MMF)



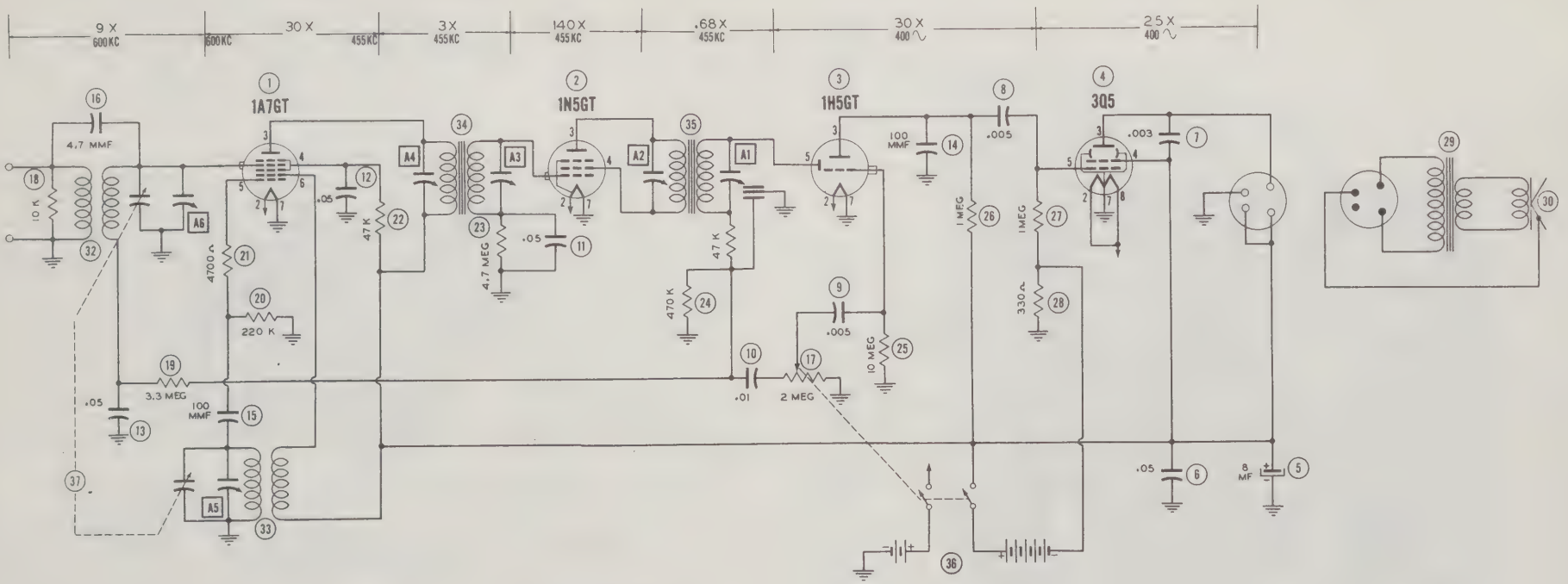
DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



DETROLA MODEL 610-A

DATE 2/49-#493-8 SET #55-FOLDER #8



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	0V.	1.6VDC	87VDC	50VDC	0V.	87VDC	0V.	-1VDC	0V.
2	1N5GT	0V.	1.6VDC	87VDC	87VDC	0V.	0V.	0V.	0V.	0V.
3	1H5GT	0V.	1.6VDC	58VDC	0V.	0V.	0V.	0V.	87VDC	0V.
4	3Q5GT	0V.	1.6VDC	80VDC	87VDC	-1VDC	80VDC	1.6VDC	0V.	-

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	0Ω	*	190KΩ	190KΩ	230KΩ	140KΩ	[illegible]	220KΩ	3.5 Meg.
2	1N5GT	0Ω	*	140KΩ	140KΩ	INF.	INF.	[illegible]	INF.	5 Meg.
3	1H5GT	INF.	*	1.1 Meg.	INF.	560Ω	INF.	[illegible]	140KΩ	10 Meg.
4	3Q5GT	0Ω	*	140KΩ	140KΩ	1 Meg.	140KΩ	*	0Ω	-

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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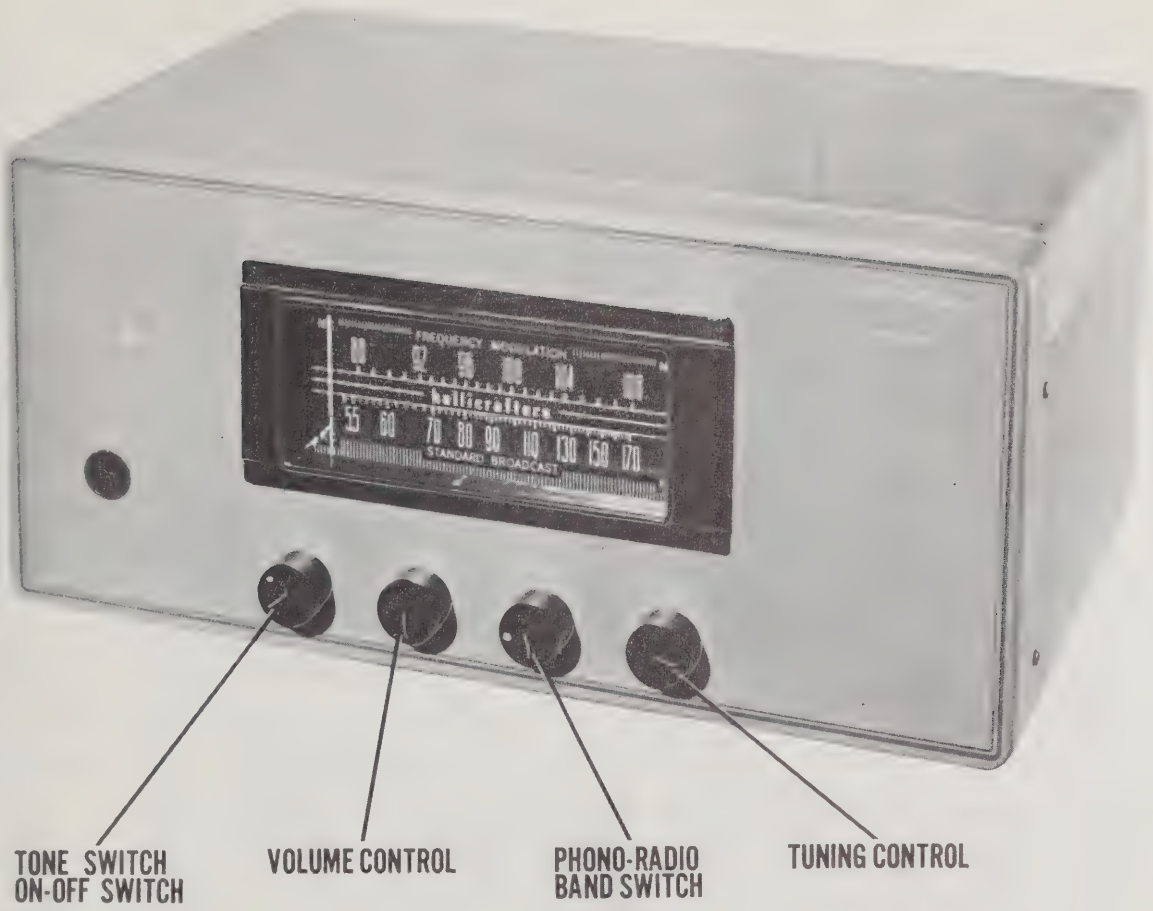
493-8

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

HALLICRAFTERS MODELS
S-55, S-56



HALLICRAFTERS MODELS
S-55, S-56

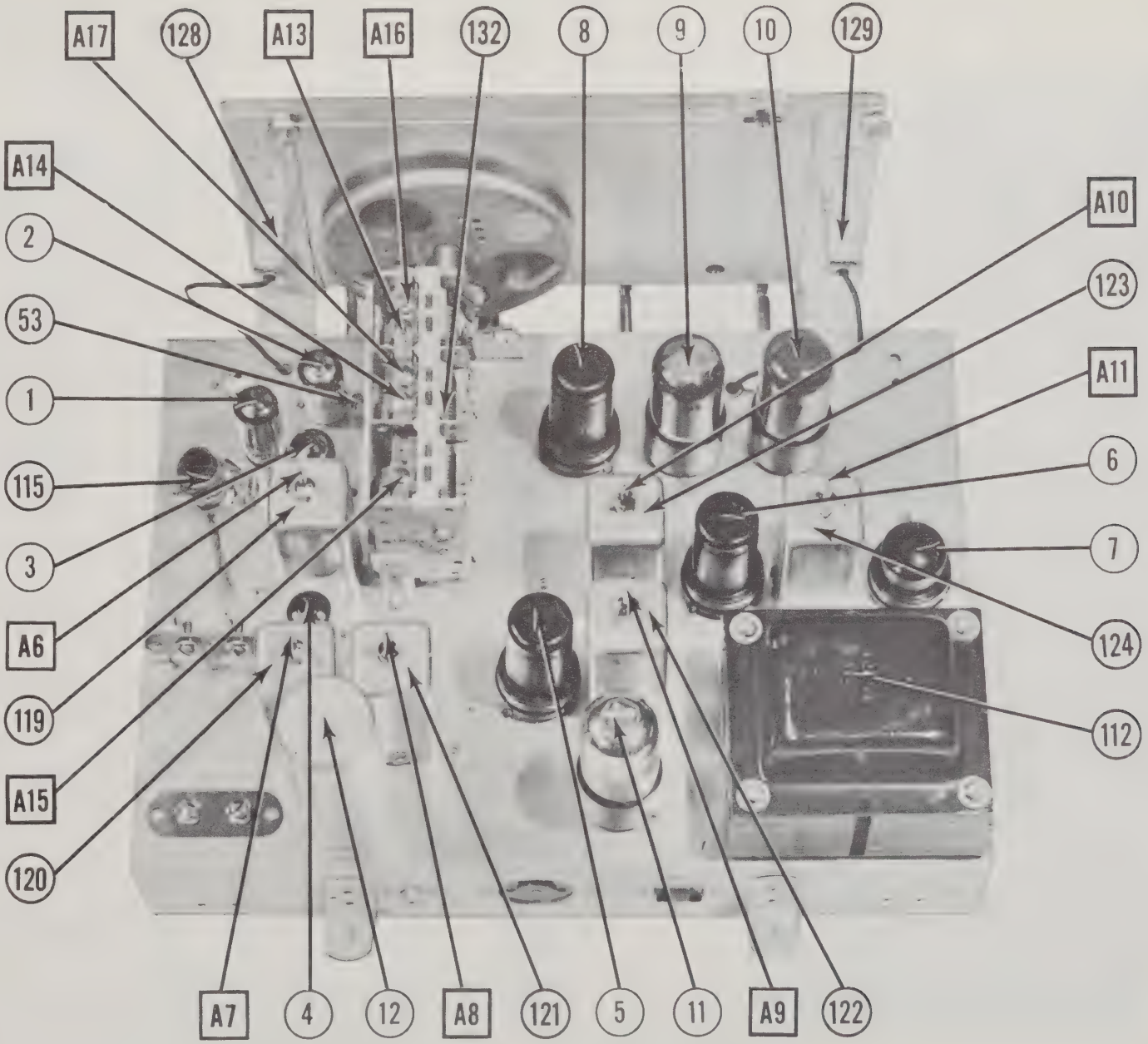
HALLICRAFTERS MODEL S-55

TRADE NAME	Hallicrafters, Models S-55, S-56
MANUFACTURER	Hallicrafters Co., 5th & Kostner Avenues, Chicago,24, Ill.
TYPE SET	AC Operated AM-FM Superheterodyne Receiver
TUBES(ELEVEN)	Types, 6AU6 FM RF Amp., 6J6 AM-FM Osc.-AFC, 6BA6 Mixer, 6BA6 1st IF Amp., 6SH7 2nd IF Amp., 6SH7 Limiter-AM Det., 6H6 FM Detector, 6SH7 AF Amp., (2) 6K6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	105-125 Volts AC
RATING	.81 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1750KC FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1949 by Howard W. Sams & Co., Inc., Indianapolis 7, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2/49-#493-9 SET #493-9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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HALLICRAFTERS PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM RF Amp.	6AU6	6AU6	7EK	
2	AM-FM Osc.-AFC	6J6	6J6	7BF	
3	Mixer	6BA6	6BA6	7BK	
4	1st IF Amp.	6BA6	6BA6	7BK	
5	2nd IF Amp.	6SH7	6SH7	8BK	
6	Limiter AM Det.	6SH7	6SH7	8BK	
7	FM Detector	6H6	6H6	7Q	
8	AF Amp.	6SN7	6SN7	8N	
9	Power Output	6K6GT	6K6GT	7S	
10	" "	6K6GT	6K6GT	7S	
11	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HALLICRAFTERS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
12A	50	450	45B113	AF4444J#	UP222245#	DY-4x20-450	D13409	◓ Filter
B	20	450		PRS450/20	BR2045	M-20-450		■ "
C	20	400						▲ "
13	10	25	45A121	PRS25/10	BR102A	M-10-25	TA-10	Cathode Bypass
14	.01	600	46AG103J	684-01	GT6S1	MPH-6-01	TC-11	Line Filter
15	.002	600	46AZ202J	684-002	GT6D2	ST-6-002	TC-22	Tone Compensation
16	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	Audio Coupling
17	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	" "
18	.05	600	46AY503J	684-05	GT6S5	ST-6-05	TC-15	AF Screen Bypass
19	.003	600	46AZ302J	684-003	GT6D3	ST-6-003	TC-23	Tone Compensation
20	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	" "
21	.005	600	46AZ502J	684-005	GT6D5	ST-6-005	TC-25	RF Bypass
22	.003	600	46AZ302J	684-003	GT6D3	ST-6-003	TC-23	Audio Coupling
23	.05	200	46AU503J	484-05	GT2S5	ST-4-05	TC-15	Diode Load Cap.
24	.05	200	46AU503J	484-05	GT2S5	ST-4-05	TC-15	" " "
25	.05	600	46AY503J	684-05	GT6S5	ST-6-05	TC-15	Limiter Decoupling
26	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	2nd IF Plate Decoup.
27	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	1st IF Plate Decoup.
28	.05	200	46AU503J	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
29	.02	400		484-02	GT4S2	ST-4-02	TC-12	AFC Filter
30	.01	600	46AZ103F	684-01	GT6S1	ST-6-01	TC-11	Osc. Decoupling
31	220	500	CM20A221M	1468-00025	5W5T25	MO.5-325	1FM-325	Output Grid Bypass
32	68	500	CM20A680M	1468-000075	5W5Q7	MOS.5-47	MS-47	Tone Compensation
33	1000	300	47B20102M5	1468-001	1W5D1	MO.3-21	1FM-21	" " " Cer.
34	150	500	CM20A151M	1468-00015	5W5T15	MO.5-315	1FM-315	FM Diode RF Filter
35	150	500	CM20A151M	1468-00015	5W5T15	MO.5-315	1FM-315	De-emphasis
36	1000	300	47B20102M5	1468-001	1W5D1	MO.3-21	1FM-21	Decoupling-Cer.
37	47	500		1468-00005	5W5Q5	MO.5-45	1FM-45	Limiter Grid Filter
38	150	500	CM20A151M	1468-00015	5W5T15	MO.5-315	1FM-315	RF Bypass
39	150	500	CM20A151M	1468-00015	5W5T15	MO.5-315	1FM-315	" "
40	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	2nd IF Screen Byp.-Cer.
41	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	2nd IF Cath. Byp. "
42	1000	300	47B20102M5	1468-001	1W5D1	MO.3-21	1FM-21	Fil. Bypass "
43	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	" " -Note "
44	12	500	CM20A120K	1468-00001	5W5Q1	MO.5-41	MS-41	IF Coupling
45	5	300		1468-000005	5W5V5	MO.5-55	MS-55	" "
46	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	1st IF Screen Byp. "
47	100	300	47B2010M5	1468-0001	5W5T1	MO.5-31	1FM-31	IF Coupling "
48	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	Decoupling "
49	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	Mixer Screen Bypass "
50	100	300	47B20101M5	1468-0001	5W5T1	MO.5-31	1FM-31	Mixer Grid Cap. "
51	5	300		1468-000005	5W5V5	MO.5-55	MS-55	Osc. Coupling "
52	47	300	CC20UK470M	1468-00005	5W5Q5	MO.5-45	1FM-45	" " "
53	7	300	CC20UJ070K					Fixed Trimmer "
54	47	300	CC20UK470M	1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap. "
55	100	300	47B20101M5	1468-0001	5W5T1	MO.5-31	1FM-31	Phase Shift Cap. "
56	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	Osc. Cathode Byp. "
57	33	300	CC20UK330K		5W5Q3	MO.5-43	MS-43	FM RF Coupling "
58	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	RF Plate Decoup. "
59	5000	300	47A168	1467-005	1D5D5	MW.5-25	1FM-25	RF Screen Bypass "
60	100	300	47B20101M5	1468-0001	5W5T1	MO.5-31	1FM-31	RF Coupling "
61	100	500	CM20A101M	1469-0001	5R5T1	MOS.5-31	MS-31	Fixed Trimmer

#Parallel sections to obtain desired capacity. Note-Not used in all models.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: HALLICRAFT. PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
113	17,000Ω CT	500Ω	57Ω CT	18.5Ω	55B109-A			A-3627	

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: MEISSNER PART No.
114A	Ant.Coil BC	41Ω	5.6Ω	51B1059	
B	Mixer " "	.6Ω	4Ω		
115	Ant.Coil FM	0Ω	0Ω	51B1021	
116	RF Coil FM		0Ω	51B1022	
117	Osc.Coil BC	1.5Ω	5Ω	51B1020	14-1060
118	" " FM	0Ω	0Ω	51B1023	
119A	1st IF AM	7Ω		50B367	
B	" " FM	0Ω			
120A	2nd IF AM	7Ω		50B370	
B	" " FM	0Ω			
121A	2nd IF AM		7Ω	50B366	
B	" " FM		0Ω		
122A	3rd IF AM	7Ω		50B370	
B	" " FM	0Ω			
123A	3rd IF AM		7Ω	50B366	
B	3rd IF FM		0Ω		
124	FM Det. Trans.	0Ω	0Ω	50B368	
125	RF Plate Choke		0Ω	53B124	
126	Fil. Choke		0Ω	53B123	
127	" "		0Ω	53B123	

FORM No. 306

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: HALLICRAFTERS PART No.	REPLACEMENT DATA	INSTALLATION NOTES
128	Bayonet	6-8	0.25	Blue	39A003		Type #44
129	"	6-8	0.25	"	39A003		" "

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
130	Switch	60B318	Band
131	"	60B319	On/Off-Tone
132	3 Gang Var. Cap	46C196	(35-479MMF, 26-471MMF, 30-228MMF)
	Dial Glass	22C201	Calibrated
	Dial Glass	22B205	Clear
	Dial Pointer	82A147	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

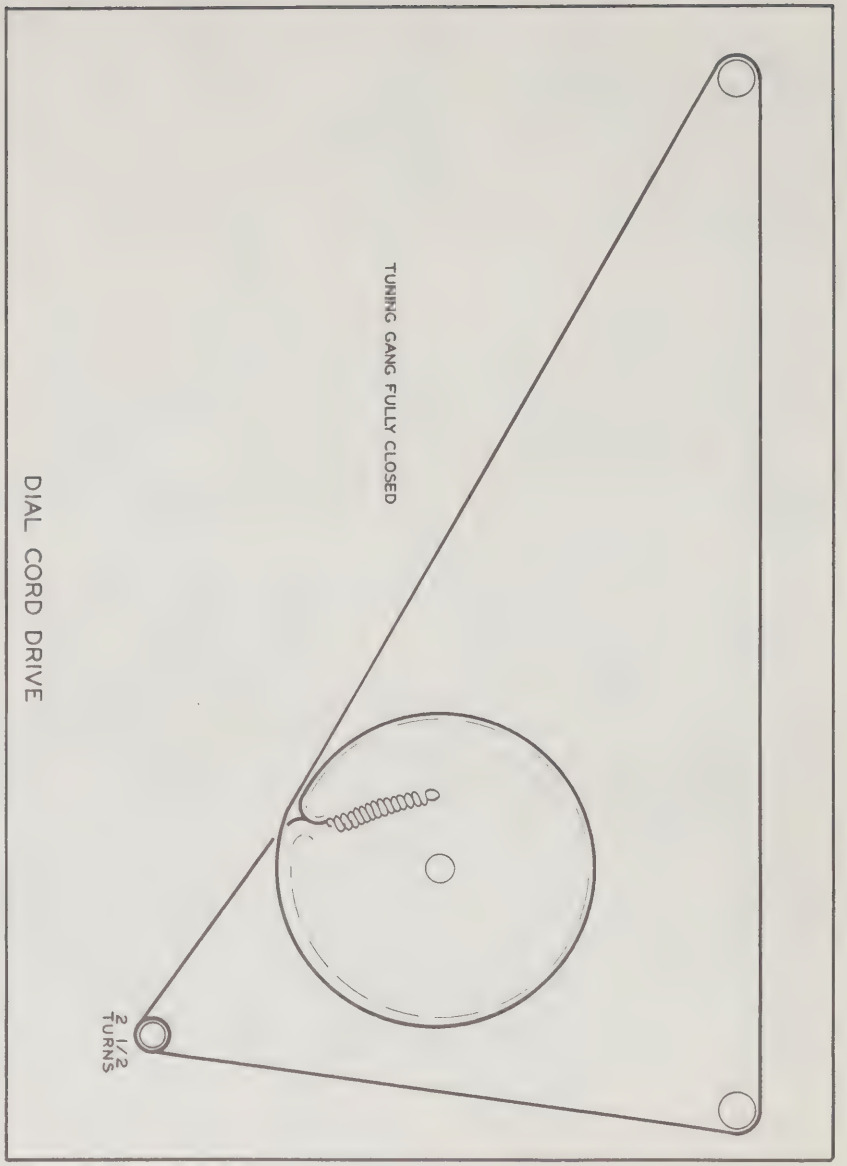
ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	HALLICRAFTERS PART No.	IRC PART No.	CLAROSTAT PART No.	
62A	2 Meg.	½	255623		AT-119	Volume Control tapped @ 200KΩ
B	Shaft		Not Req.		KSS-3	Attach to 62A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	HALLICRAFTERS PART No.	IRC PART No.	
63	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. FM-RF Grid
64	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. FM-RF Screen Dropping
65	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. Mixer Grid
66	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. Mixer Screen Dropping
67	4700Ω	2	RC40AE472M	BT-2-4700	Yl.-Vi.-Red Oscillator Plate Decoupling
68	22KΩ	½	RC20AE223M	BTS-22K	Red-Red-Or. Oscillator Grid
69	150Ω	½	RC20AE151M		Br.-Grn.-Br. Oscillator Cathode
70	1Ω	½	RC20AE010M		Br.-Blk.-Blk. Parasitic Suppressor
71	220Ω	½	RC20AE221M		Red-Red-Br. Phase Shift Network
72	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. AFC Network
73	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. AFC Filter
74	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. 1st IF Grid
75	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. 1st IF Screen Dropping
76	470Ω	½	RC20AE471M	BTS-470	Yl.-Vi.-Br. Decoupling
77	270Ω	½	RC20AE271K		Red-Vi.-Br. 2nd IF Cathode
78	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. 2nd IF Screen Dropping
79	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 2nd IF Decoupling
80	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
81	22KΩ	½	RC20AE223M	BTS-22K	Red-Red-Or. Limiter Voltage Dropping
82	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. " " "
83	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. RF Filter
84	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. " "
85	330KΩ	½	RC20AE334M	BTS-330K	Or.-Or.-Yl. Limiter Grid
86	22KΩ	½	RC20AE223M	BTS-22K	Red-Red-Or. Limiter Decoupling
87	100KΩ	½	RC20AE104K	BTS-100K	Br.-Blk.-Yl. Detector Diode Load
88	100KΩ	½	RC20AE104K	BTS-100K	Br.-Blk.-Yl. " " "
89	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. De-emphasis
90	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. RF Filter
91	47KΩ	½	RC20AE473M	BTS-47K	Yl.-Vi.-Or. " "
92	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. Series Phono
93	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. Phono Shunt
94	6800Ω	½	RC20AE682M	BTS-6800	Blue-Gray-Red Tone Compensation
95	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. " "
96	100KΩ	½	RC20AE104K	BTS-100K	Br.-Blk.-Yl. " "
97	100KΩ	½	RC20AE104K	BTS-100K	Br.-Blk.-Yl. " "
98	330Ω	½	RC20AE331K	BW-½-330	Or.-Or.-Br. AF Cathode
99	100KΩ	1	RC30AE104K	BTA-100K	Br.-Blk.-Yl. AF Cathode Bias
100	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. AF Screen Dropping
101	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
102	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. Output Grid
103	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. " "
104	300Ω	2	RC40AE301J	BW-2-330	Or.-Blk.-Br. Output Cathode
105	6800Ω	½	RC20AE682M	BTS-6800	Blue-Gray-Red Output Screen Load
106	1500Ω	2	RC40AE152K	BT-2-1500	Br.-Grn.-Red Filter
107	1500Ω	2	RC40AE152K	BT-2-1500	Br.-Grn.-Red "
108	1200Ω	2	RC40AE122K	BT-2-1200	Br.-Red-Red "
109	1200Ω	2	RC40AE122K	BT-2-1200	Br.-Red-Red "
110	12KΩ	½	RC20AE123K	BTS-12K	Br.-Red-Or. Tone Compensation
111	470Ω	½	RC20AE471M	BTS-470	Yl.-Vi.-Br. FM-RF Decoupling

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	HALLICRAFTERS PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
112	117VAC @ .61A	650VCT @ 113ADC	5.3VAC @ 2.0A	6.6VAC @ 3.65A	52C152	P-8013	T-20R05	P-2953



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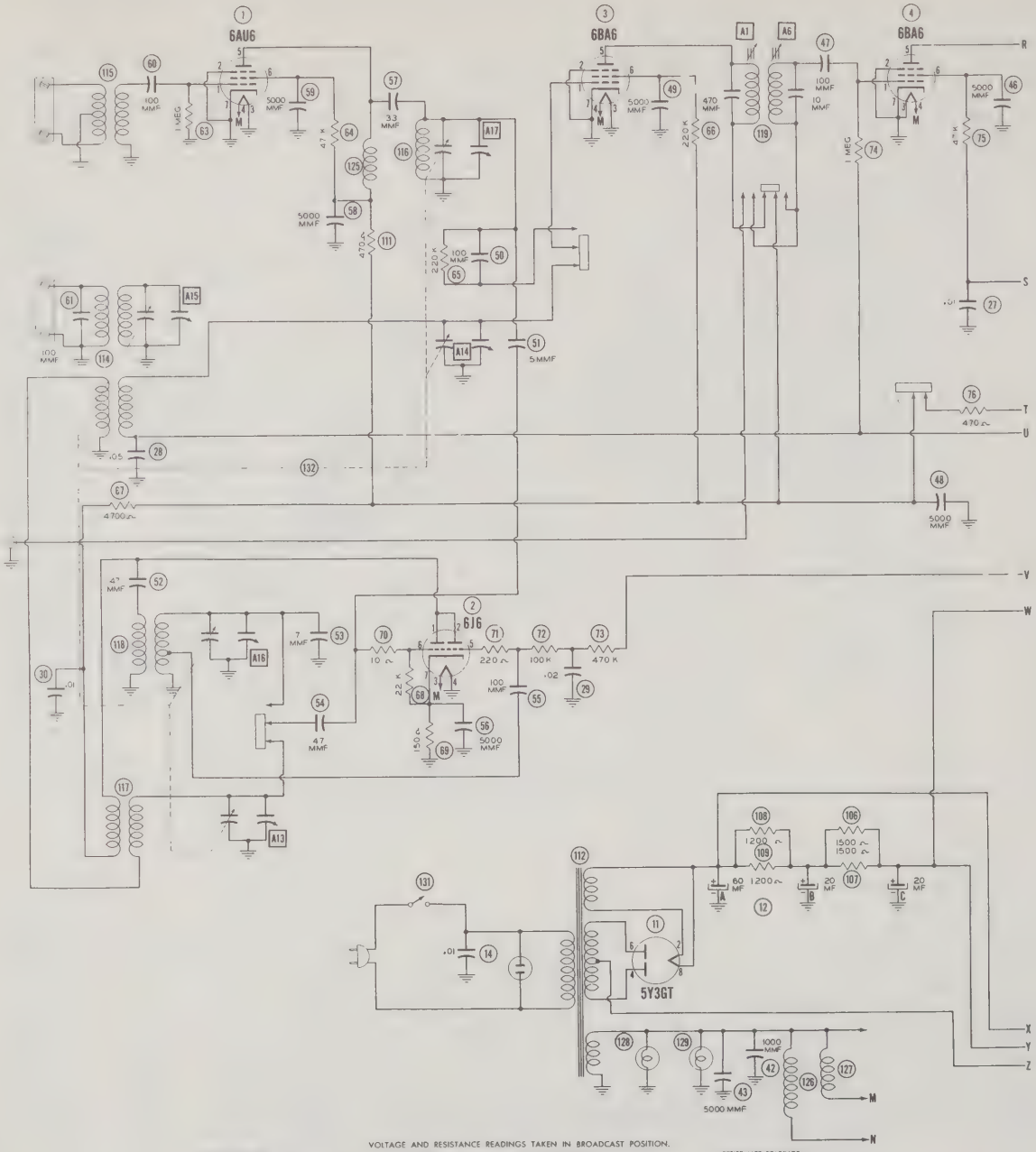

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.
RADIO PHONO SWITCH IN RADIO POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡ 1	6AU6	-.7VDC	0V.	0V.	6.6VAC	235VDC	100VDC	0V.	-
2A	6J6	175VDC	175VDC	6.6VAC	0V.	0V.	-8VDC§	2.6VDC	-
‡ 2B	6J6	155VDC	155VDC	6.6VAC	0V.	0V.	2.8VDC§	3VDC	-
3	6BA6	-2.6VDC	0V.	0V.	6.6VAC	260VDC	45VDC	0V.	-
4	6BA6	-.2VDC	0V.	0V.	6.6VAC	260VDC	100VDC	0V.	-
5	6SH7	0V.	0V.	2VDC	0V.	2VDC	145VDC	6.6VAC	260VDC
‡ 6A	6SH7	0V.	0V.	0V.	-1.7VDC	0V.	0V.	6.6VAC	0V.
‡ 6B	6SH7	0V.	0V.	0V.	-.6VDC	0V.	48VDC	6.6VAC	48VDC
7	6H6	0V.	0V.	-.6VDC	.1VDC	-.1VDC	0V.	6.6VAC	.6VDC
8	6BJ7	0V.	0V.	1.1VDC	0V.	1.1VDC	.1VDC	6.6VAC	63VDC
9	6K6GT	0V.	0V.	330VDC	220VDC	0V.	0V.	6.6VAC	18VDC
10	6K6GT	0V.	0V.	330VDC	260VDC	0V.	330VDC	6.6VAC	18VDC
11	5Y3GT	300VDC	340VDC	0V.	340VAC	0V.	340VAC	0V.	340VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡ 1	6AU6	1 Meg.	0Ω	9Ω	.1Ω	40KΩ	90KΩ	0Ω	-
2A	6J6	45KΩ	45KΩ	.1Ω	0Ω	INF.	22KΩ	150Ω	-
‡ 2B	6J6	45KΩ	45KΩ	.1Ω	0Ω	INF.	22KΩ	150Ω	-
3	6BA6	2.5 Meg.	0Ω	0Ω	.1Ω	40KΩ	260KΩ	0Ω	-
4	6BA6	3.5 Meg.	0Ω	0Ω	.1Ω	40KΩ	90KΩ	0Ω	-
5	6SH7	0Ω	0Ω	270Ω	7Ω	270Ω	100KΩ	.1Ω	40KΩ
6A	6SH7	0Ω	0Ω	0Ω	440KΩ	0Ω	INF.	.1Ω	INF.
‡ 6B	6SH7	0Ω	0Ω	0Ω	440KΩ	0Ω	140KΩ	.1Ω	140KΩ
‡ 7	6H6	0Ω	0Ω	100KΩ	INF.	INF.	INF.	.1Ω	100KΩ
8	6BJ7	0Ω	0Ω	330Ω	2 Meg.	330Ω	2.2 Meg.	.1Ω	510KΩ
9	6K6GT	0Ω	0Ω	40KΩ	50KΩ	470KΩ	INF.	.1Ω	300Ω
10	6K6GT	0Ω	0Ω	40KΩ	40KΩ	470KΩ	60KΩ	.1Ω	300Ω
11	5Y3GT	40KΩ	40KΩ	INF.	95Ω	INF.	90Ω	INF.	40KΩ

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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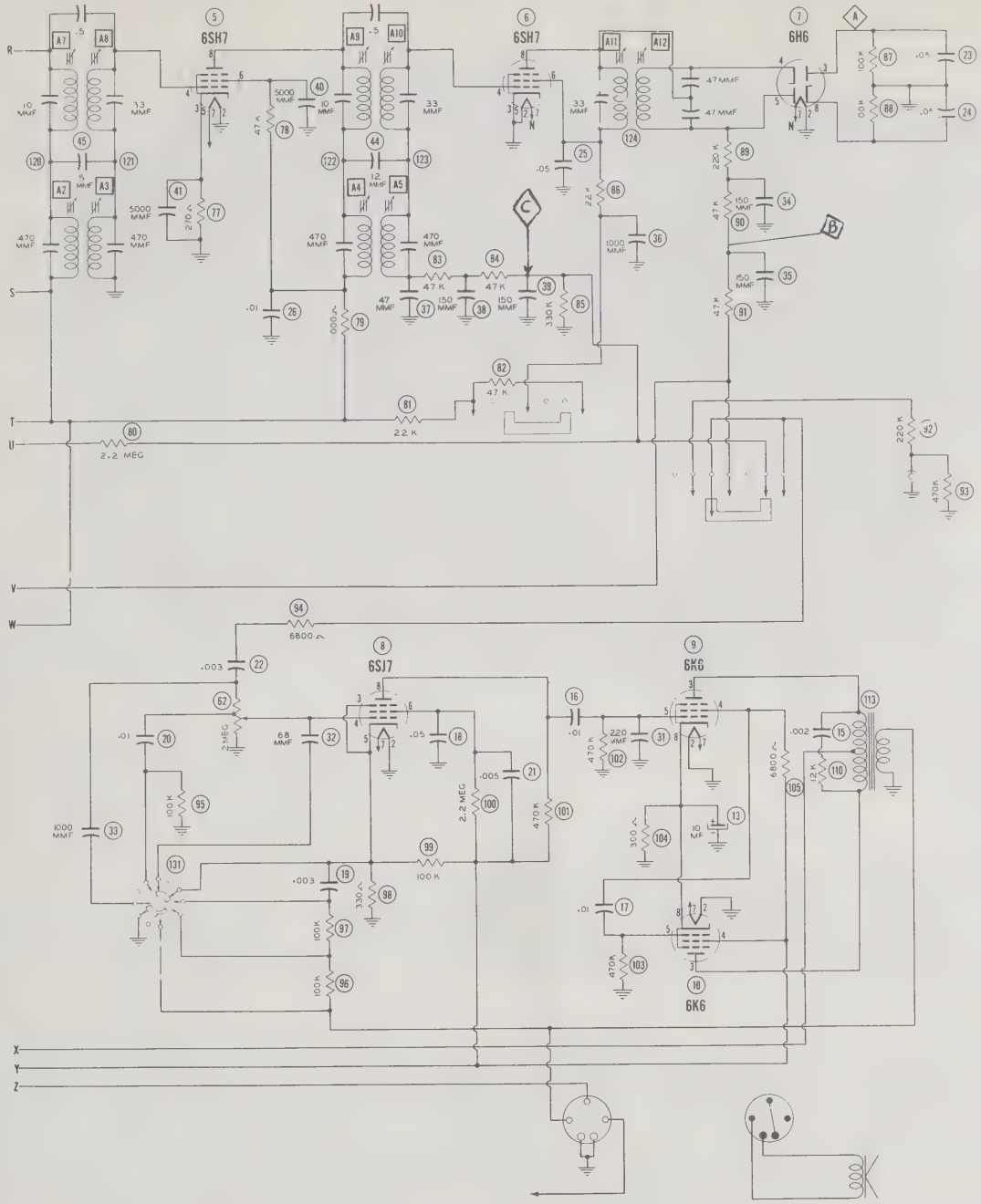

STAGE GAIN MEASUREMENTS

ANTENNA TO MIXER GRID	6X	600KC	2nd IF TUBE	1.0X	455KC
MIXER GAIN	.8X	IN 600KC OUT 455KC	3rd IF TRANS.	.4X	455KC
			AUDIO	5.5X	400 ∿
MIXER PLATE TO 1st IF PLATE	6X	455KC	OUTPUT	25X	400 ∿
2nd IF TRANS.	.5X	455KC			

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

AM IF ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to center AM stator of tuning cap. Low side to chassis.	455KC	BC (center position)	Approximately mid-scale	Across voice coil	A1, A2, A3, A4 A5	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
2	.01 MFD cap. in series with 4700Ω carbon res.	High side to center FM stator of tuning cap. Low side to chassis.	21.75MC (Unmodulated)	FM (fully clockwise)	Approximately mid-scale	DC probe to Point (A). Common to chassis	A6, A7, A8, A9, A10, A11	Adjust for maximum deflection.
3	.01 MFD	"	"	"	"	DC probe to Point (B). Common to chassis	A12	Adjust for zero deflection. Continue with AM-RF Alignment in Step 5.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
2	.01 MFD	High side to Pin 1 (grid) of 6BA6 1st IF Tube (4). Low side to chassis.	21.75MC (Freq. Mod.)	FM (fully clockwise)	Approximately mid-scale	Vertical input to Point (A). Ground to chassis.	A10, A9 A8, A7	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
3	.01 MFD	High side to center FM stator of tuning cap. Low side to chassis.	"	"	"	"	A6	"
4	.01 MFD	High side to Pin 1 (grid) of 6BA6 1st IF Tube (4). Low side to chassis.	"	"	"	Vertical input to Point (B). Ground to chassis.	A11, A12	Alternately adjust A11 for maximum amplitude and straightness of crossover lines, and A12 for centering of crossover point on scope horizontal sweep line per Fig. 2. Continue with AM-RF Alignment in Step 5.

AM RF ALIGNMENT

Standard RMA dummy consists of a 200 MMFD cap. in series with a 20 Microhenry RF Choke which is shunted by a 400 MMFD capacitor in series with a 400Ω carbon resistor.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5	RMA Dummy (See prealignment)	High side in series with dummy ant. to ant. terminal "G". Low side to chassis.	1500KC	AM (Center position)	1500KC	Across voice coil	A13	Adjust for maximum output.
6	"	"	"	"	Tune for maximum output.	"	A14, A15	" " " "

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7	2 - 150 ohm carbon res.	Each side in series with 150Ω resistor to FM Ant. terminals.	105MC (Unmodulated)	FM (Fully clockwise)	105MC	DC probe to Point (C). Common to chassis.	A16	Adjust for maximum deflection.
8	"	"	"	"	Tune for maximum deflection.	"	A17	Rock tuning cap. and adjust for maximum deflection.

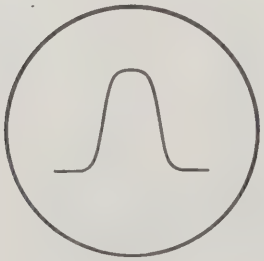


FIG. 1

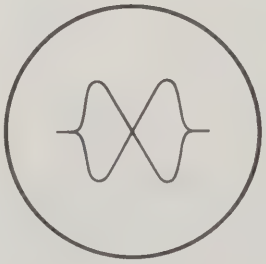
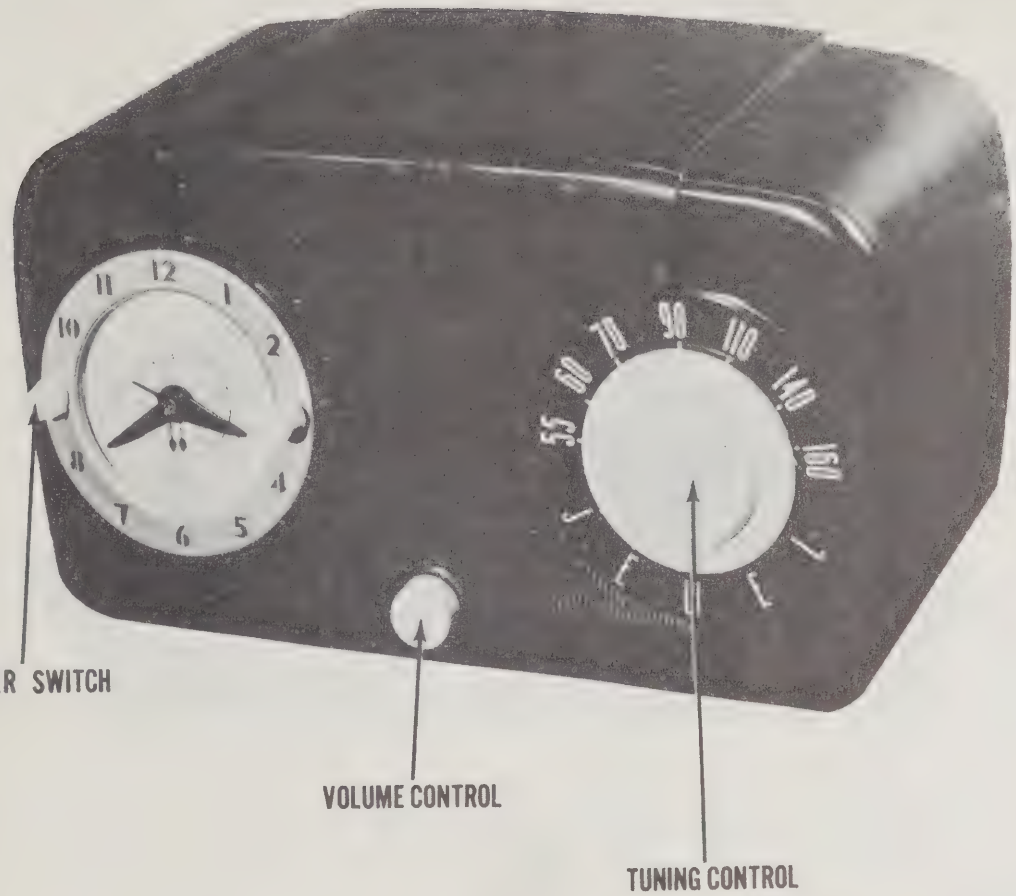


FIG. 2



JEWEL MODEL 920

TRADE NAME	Jewel, Model 920
MANUFACTURER	Jewel Radio Corp., 583 Sixth Ave., New York 11, N.Y.
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50C5 Power Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1620KC RATING .23 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 7 (grid) of 12BE6. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A5 for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1949 by Howard W. Sams & Co., Inc., Indianapolis 7, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2/49-#493-10 SET #55-FOLDER #10

PARTS LIST AND DESCRIPTIONS

JEWEL MODEL [illegible]

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1.2BE6	1.2BE6	7CH	
2	IF Amp.	1.2BA6	1.2BA6	7BK	
3	Det.-AVC-AF	1.2AT6	1.2AT6	7ET	
4	Power Output	50C5	50C5		
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: JEWEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	31-15	PRSA150/40-40	EDL4415	DSB-2x40-150	TA-440	Filter-Red
B	40	150						" "
7	.05	400	32-5	484-05	GT485	ST-4-05	TC-15	Line Filter
8	.2	300	32-32	484-2	GT4P25	ST-4-2	72P1	Line Isolation
9	.01	400	32-1	484-01	GT4S1	ST-4-01	TC-11	Output Plate Bypass
10	.01	400	32-29	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
11	.005	400	32-20	484-005	GT4D5	ST-4-005	TC-25	" "
12	.05	200	32-4	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
13	120	500	35-4	1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
14	120	500	35-4	1468-0001	5W5T1	MO.5-31	1FM-31	RF Diode Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
15A	1 Meg.	½	30-158	D1%-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 15A per instructions

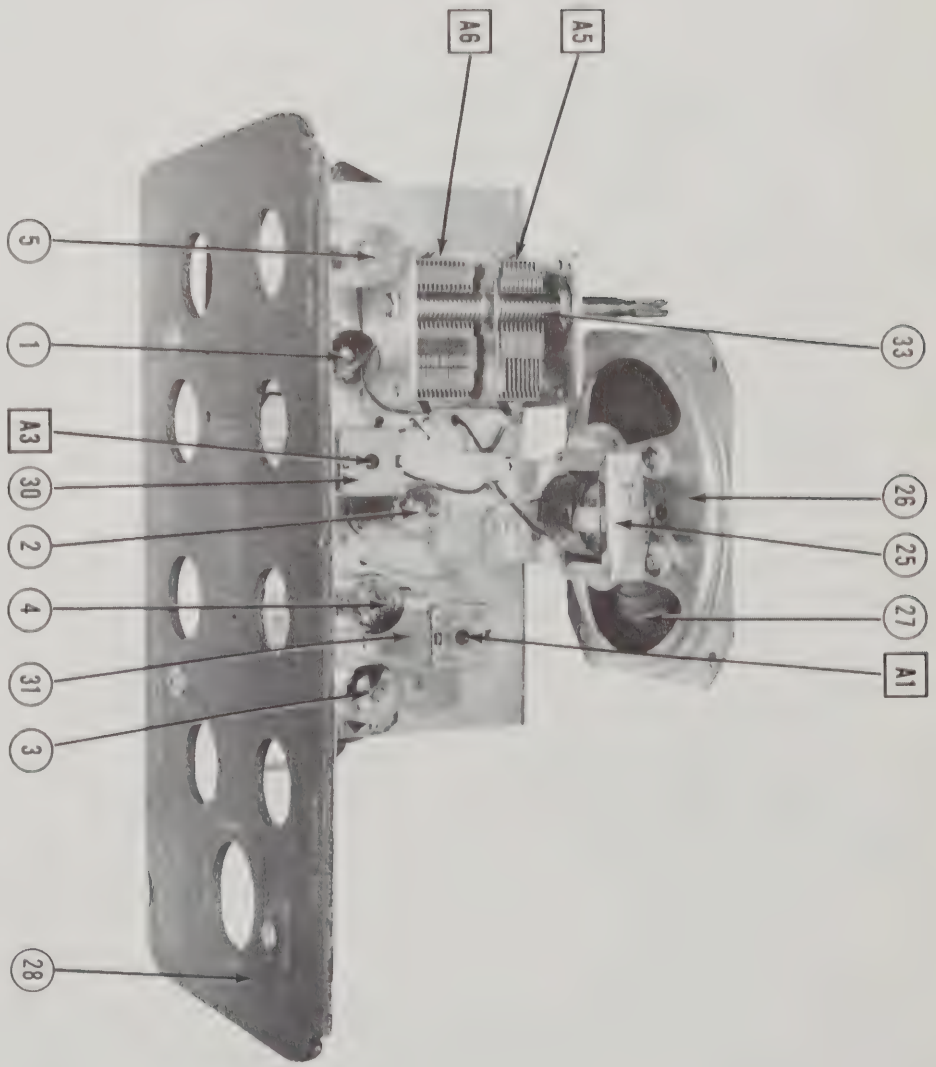
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
16	20KΩ	½	20-82	BTS-22K	Red-Blk.-Or. Osc. Grid
17	150Ω	½	20-89	BW-½-150	Br.-Grn.-Br. IF Cathode
18	3 Meg.	½	20-56	BTS-3.3 Meg.	Or.-Blk.-Grn. AVC Network
19	10 Meg.	½	20-57	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
20	470KΩ	½	20-92	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
21	470KΩ	½	20-92	BTS-470K	Yl.-Vi.-Yl. Output Grid
22	150Ω	½	20-81	BW-½-150	Br.-Grn.-Br. Output Cathode
23	1500Ω	1	20-73	BTA-1500	Br.-Grn.-Red Filter
24	22Ω	2	20-93		Red-Red-Blk. Rect. Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
25	3000Ω	3.2Ω	170Ω	.5Ω				A-2998#	#Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: JEWEL PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
26	FIELD PM	VC IMP. 3.1Ω		ST-113† Mod. P4-X	4A07†	†Fabricate new mounting bracket.
27	CONE DIA. 4"	VC DIA. 9/16"				

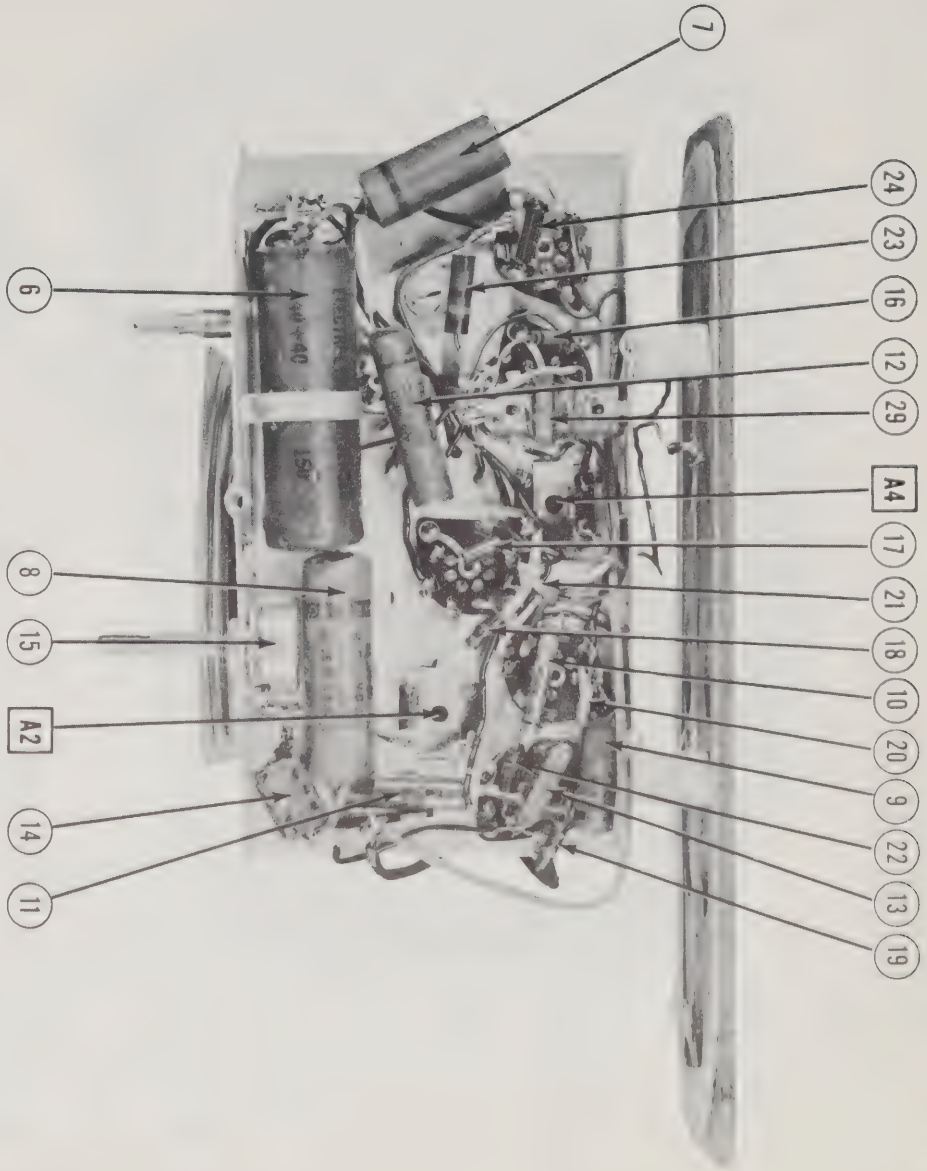
R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: MEISSNER PART No.
28	Loop Ant.		1.8Ω		
29	Osc. Coil	.8Ω	5Ω		
30	Input IF	18Ω	18Ω		16-6678
31	Output IF	18Ω	18Ω		16-6678

MISCELLANEOUS

ITEM No.	PART NAME	JEWEL PART No.	NOTES
22	Switch		Power
23	2 Gang Var. Cap.	30-15	(22-462MMF, 3.-200MMF)

CHASSIS—BOTTOM VIEW



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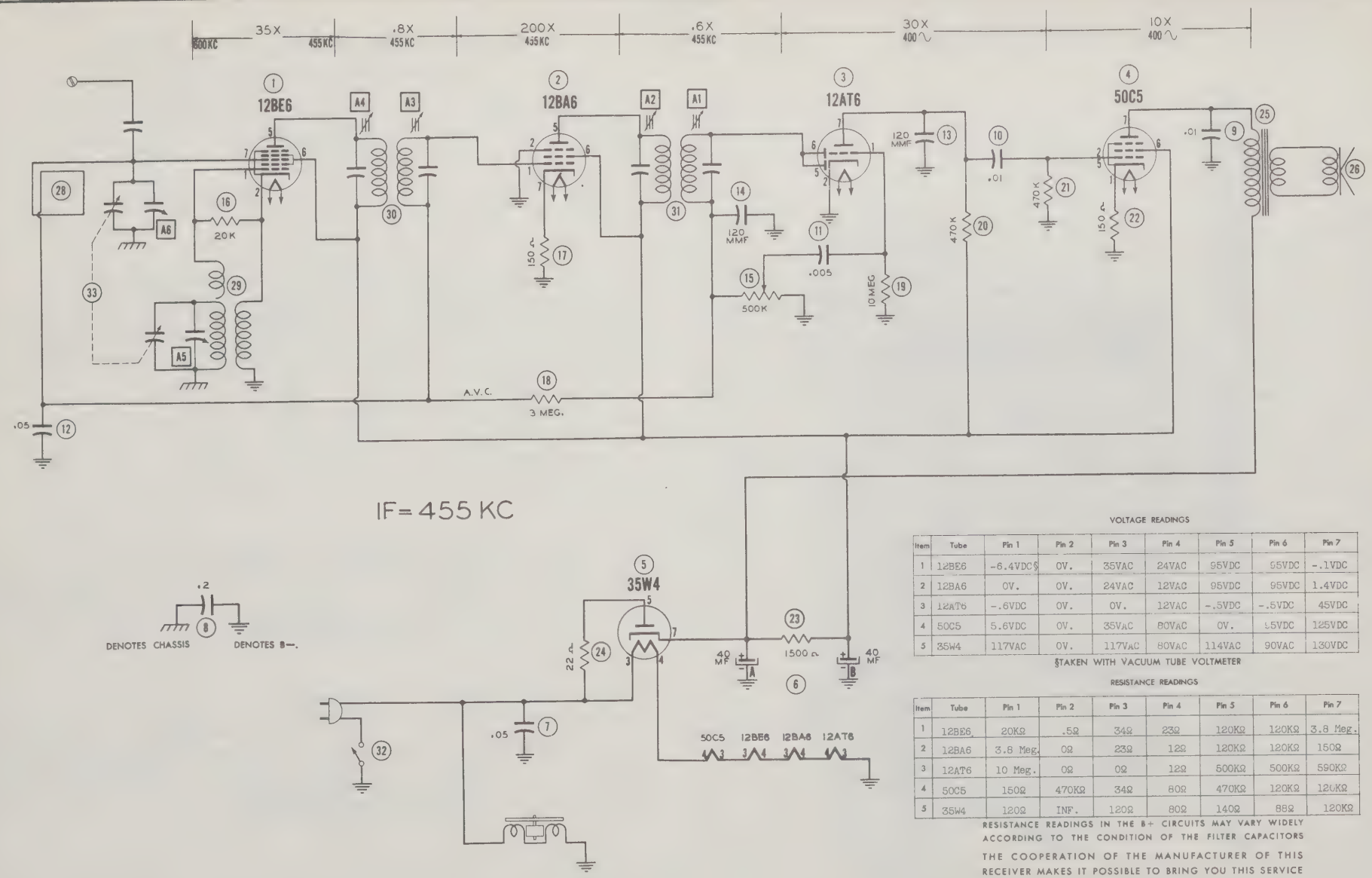

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-6.4VDC§	0V.	35VAC	24VAC	95VDC	95VDC	-.1VDC
2	12BA6	0V.	0V.	24VAC	12VAC	95VDC	95VDC	1.4VDC
3	12AT6	-.6VDC	0V.	0V.	12VAC	-.5VDC	-.5VDC	45VDC
4	50C5	5.6VDC	0V.	35VAC	80VAC	0V.	95VDC	125VDC
5	35W4	117VAC	0V.	117VAC	80VAC	114VAC	90VAC	130VDC

§TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	20KΩ	.5Ω	34Ω	23Ω	120KΩ	120KΩ	3.8 Meg.
2	12BA6	3.8 Meg.	0Ω	23Ω	12Ω	120KΩ	120KΩ	150Ω
3	12AT6	10 Meg.	0Ω	0Ω	12Ω	500KΩ	500KΩ	590KΩ
4	50C5	150Ω	470KΩ	34Ω	80Ω	470KΩ	120KΩ	120KΩ
5	35W4	120Ω	INF.	120Ω	80Ω	140Ω	88Ω	120KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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493-10

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

KNIGHT MODELS
5D-250, 5D-251

KNIGHT MODELS
5D-250, 5D-251

KNIGHT MODEL 5D-250

TRADE NAME	Knight, Models 5D-250, 5D-251
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-125 Volts AC-DC
TUNING RANGE—BROADCAST	540-1720KC RATING .21 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.1 MFD.	"	1720KC	"	"	A5	Adjust for maximum output.
3	200MMFD	High side to ext. ant. lead. Low side to B-.	1400KC	Tune for maximum output.	"	A6	" " " "
4	200MMFD	"	600KC	"	"	A7	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 & 4 until no further improvement can be made.

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DATE 2/49-#493-11 SET #55-FOLDER #11

PARTS LIST AND DESCRIPTIONS

KNIGHT
MODEL 5D-250

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		KNIGHT PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7GT	12SA7GT	6AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
6A	40	150	EC-12	PRSA150-20-40	EDL4215	DSB-3x20-150*	TA-240	Filter-Red
B	20	150						" -Yl.
7	.05	600	PC-5	684-05	GT6S5	MPH-6-05	TC-15	Line Filter
8	.01	400	PC-7	484-01	GT4S1	ST-4-01	TC-11	Output Plate Bypass
9	.01	400	PC-7	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
10	.01	400	PC-7	484-01	GT4S1	ST-4-01	TC-11	" "
11	.05	600	PC-5	684-05	GT6S5	ST-6-05	TC-15	AVC Filter
12	.1	400	PC-8	484-.1	GT4P1	ST-4-1	TC-1	Line Isolation
13	.01	400	PC-7	484-01	GT4S1	ST-4-01	TC-11	Ext. Ant. Coupling
14	500	500	MC-5	1468-0005	5W5T5	MO.5-35	1FM-35	AF Plate Bypass
15	100	500	MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter
16	100	500	MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
38	10	500		1469-000001	5R5Q1	MOS.5-31	MS-41	Fixed Trimmer-Cer.

*Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	
17A	1 Meg.	½	VC-4	D13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 17A per instructions
C	Switch		" "	41	SW-A	" " " " "

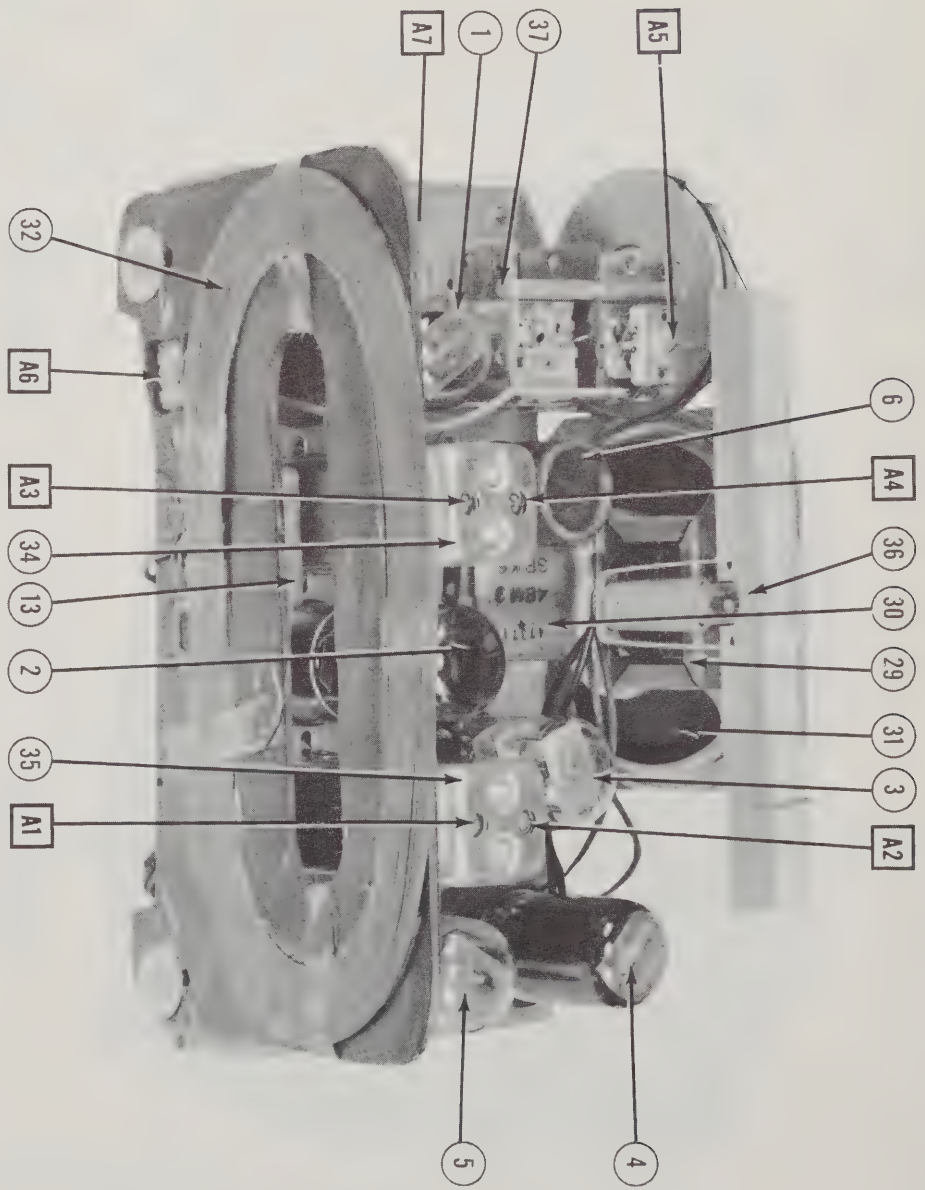
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	KNIGHT PART No.	IRC PART No.	
18	22KΩ	½	1R-9	BTS-22K	Red-Red-Or. Oscillator Grid
19	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Line Isolation
20	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
21	47KΩ	½	1R-10	BTS-47K	Yl.-Vi.-Or. Diode RF Filter
22	2.2 Meg.	½	1R-13	BTS-2.2 Meg.	Red-Red-Grn. AF Grid
23	470KΩ	½	1R-11	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
24	470KΩ	½	1R-11	BTS-470K	Yl.-Vi.-Yl. Output Grid
25	150Ω	½	1R-14		Br.-Grn.-Br. Output Cathode
26	2200Ω	1	1R-25	BTA-2200	Red-Red-Red Filter
27	33Ω	½	1R-17	BW-½-33	Or.-Or.-Blk. Surge Limiter
28	33Ω	½	1R-17	BW-½-33	Or.-Or.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		KNIGHT PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
29	2300Ω	3.4Ω	150Ω	.5Ω	Part of SPK-6	A-3876‡	T22S45‡	A-2928‡	‡Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA KNIGHT PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-113†		†Drill and tap magnet frame.
30	PM	34.Ω	SPK-6	Mod. P4-X	4A07	
	CONE DIA.	VC DIA.				
31	4"	9/16"				

R F COILS

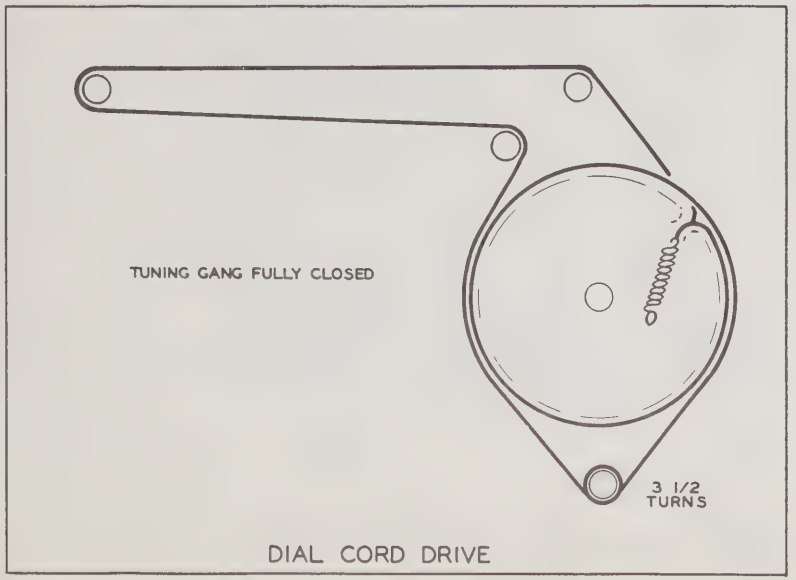
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA KNIGHT PART No.	MEISSNER PART No.
32	Loop Ant.	.2Ω	1Ω	LL-4	
33	Osc. Coil		6.5Ω	LO-7	14-1040
34	Input IF	19Ω	19Ω	LI-1	16-6658
35	Output IF	20.5Ω	19Ω	LI-2	16-6660

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA KNIGHT PART No.		INSTALLATION NOTES
36	Bayonet	6-8	0.15	Brown	PB-1		Type 47

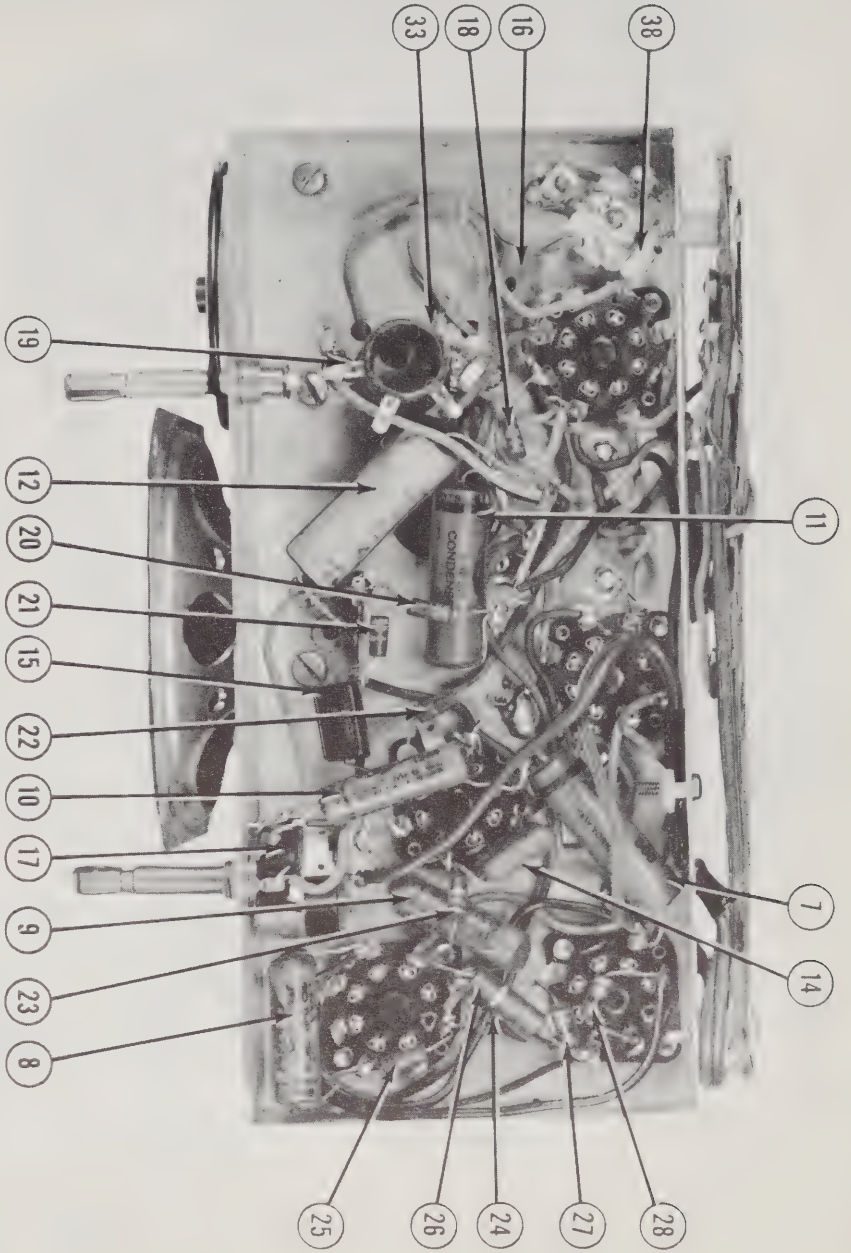
MISCELLANEOUS

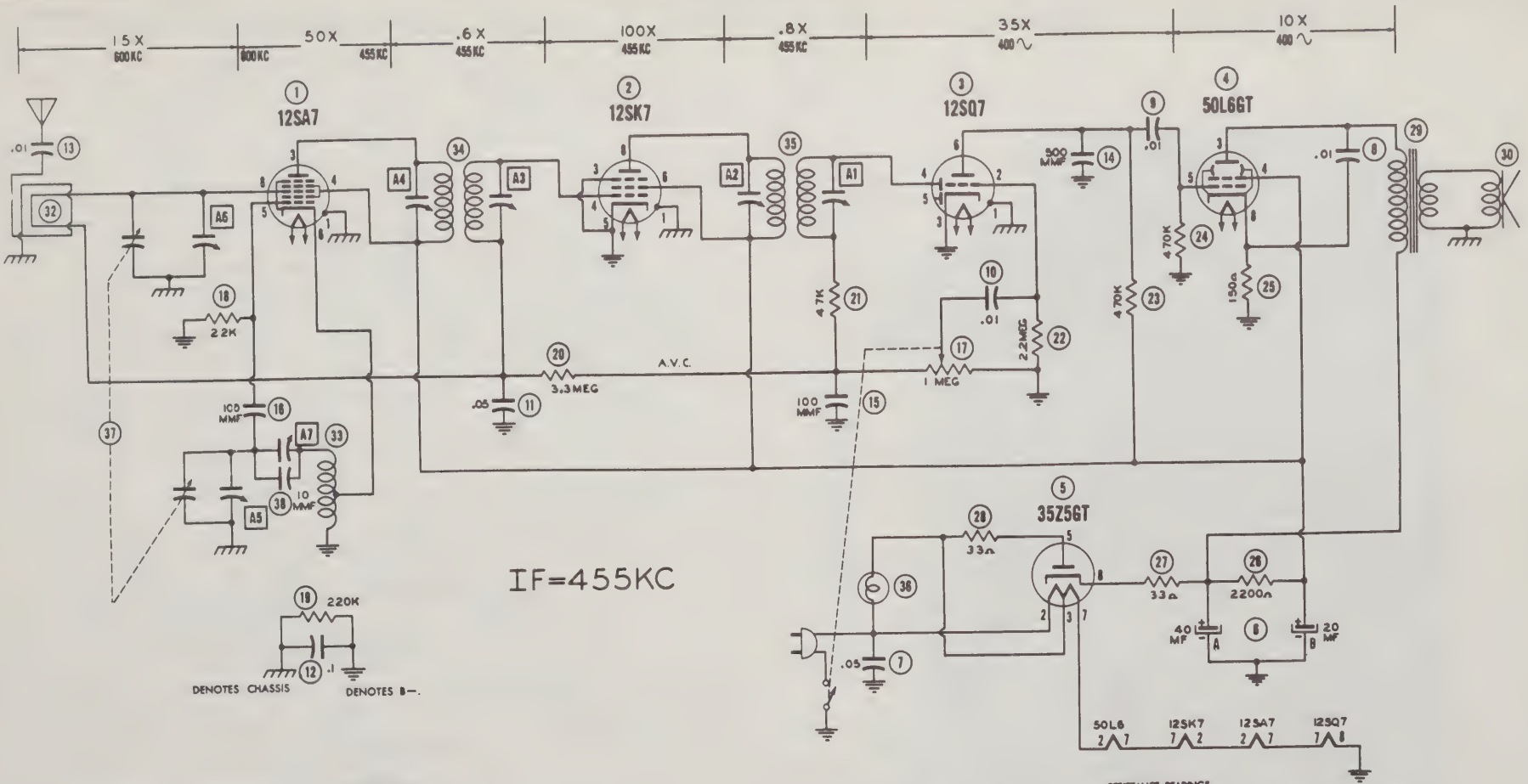
ITEM No.	PART NAME	KNIGHT PART No.	NOTES
37	2 Gang Var. Cap.	GC-1	(16-562MMF, 15-475MMF)
A5	Trimmer	TC-6	Osc. Adj.
A6	"	TC-7	Ant. Adj.
A7	Padder	TC-9	Osc. Adj.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V.	24.5VAC	72VDC	72VDC	-9VDC§	0V.	12VAC	-.6VDC
2	12SK7GT	0V.	24.5VAC	0V.	-.6VDC	0V.	72VDC	37VAC	72VDC
3	12SQ7GT	0V.	-.8VDC	0V.	-.4VDC	0V.	37VDC	12VAC	0V.
4	50L6GT	0V.	86VAC	112VDC	72VDC	0V.	0V.	37VAC	4.6VDC
5	35Z5GT	0V.	117VAC	113VAC	0V.	112VAC	115VDC	86VAC	117VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	24Ω	300KΩ	300KΩ	22KΩ	.5Ω	13Ω	4 Meg.
2	12SK7GT	0Ω	24Ω	0Ω	4 Meg.	0Ω	300KΩ	37Ω	300KΩ
3	12SQ7GT	0Ω	2.2 Meg.	0Ω	1 Meg.	INF.	770KΩ	13Ω	0Ω
4	50L6GT	INF.	85Ω	300KΩ	300KΩ	470KΩ	0Ω	37Ω	165Ω
5	35Z5GT	INF.	112Ω	110Ω	INF.	150Ω	300KΩ	85Ω	300KΩ

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RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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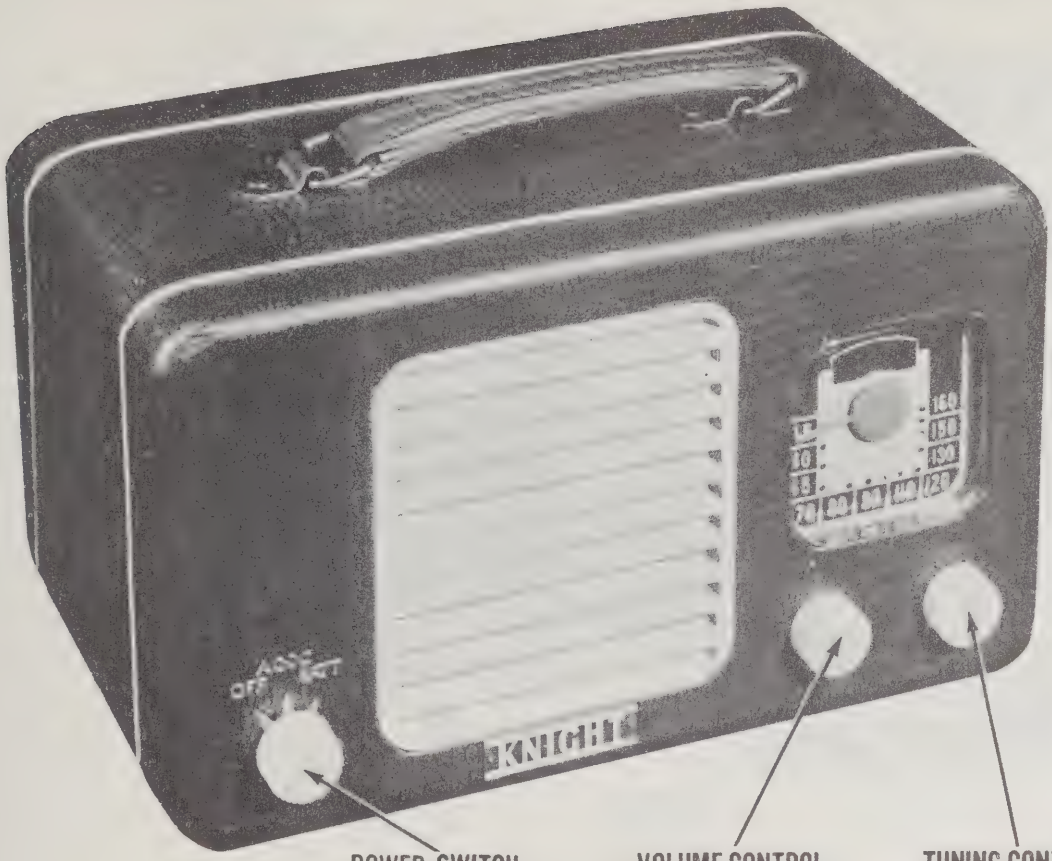
493-11

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

KNIGHT MODEL 5F-565
BATTERY-LINE OPERATED



KNIGHT MODEL 5F-565
BATTERY-LINE OPERATED

KNIGHT MODEL 5F-565

TRADE NAME	Knight, Model 5F-565
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1U4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output, 117Z3 Rectifier.
POWER SUPPLY RATING	110-125 Volts AC-DC or 3 Volts "A" Supply and 67.5 Volts "B" Supply .15 Amp. @ 117 Volts AC or 136MA @ 3 Volts DC and 13.2MA @ 67.5 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer parallel with base of dial.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2	.1 MFD	"	1650KC	"	"	A5	Adjust for maximum output. Reassemble in cabinet.
3		Wrap one turn of high side of sig. gen. lead around outside of cab.	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output. A6 is accessible by removing plug button in end of cabinet.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1U4	1U4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	
5	Rectifier	117Z3	117Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	EC-14			DY-3x40-150	TA-440	Filter-Red
B	40	150					UT-121	" -Blue
C	20	150						" -Yl.
7	70	10	EC-6		BRH121	M-100-12	UHC-112	Fil. Bypass
8	.05	600	PC-5	684-05	GT6S5	MPH-6-05	TC-15	Line Filter
9	.005	600	PC-6	684-005	GT6D5	ST-6-005	TC-25	Output Plate Bypass
10	.005	600	PC-6	684-005	GT6D5	ST-6-005	TC-25	Audio Coupling
11	.01	400	PC-7	484-01	GT4S1	ST-4-01	TC-11	AF Screen Bypass
12	.005	600	PC-6	684-005	GT6D5	ST-6-005	TC-25	Audio Coupling
13	.01	200	PC-7	484-01	GT2S1	ST-4-01	TC-11	IF Grid Filter
14	.1	200	PC-3	484-.1	GT2P1	ST-2-1	TC-1	Fil. Bypass
15	.05	600	PC-5	684-05	GT6S5	ST-6-05	TC-15	AVC Filter
16	.01	200	PC-7	484-01	GT2S1	ST-4-01	TC-11	Decoupling
17	.1	400	PC-8	484-.1	GT4P1	ST-4-1	TC-1	Line Isolation
18	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
19	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter
20	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.

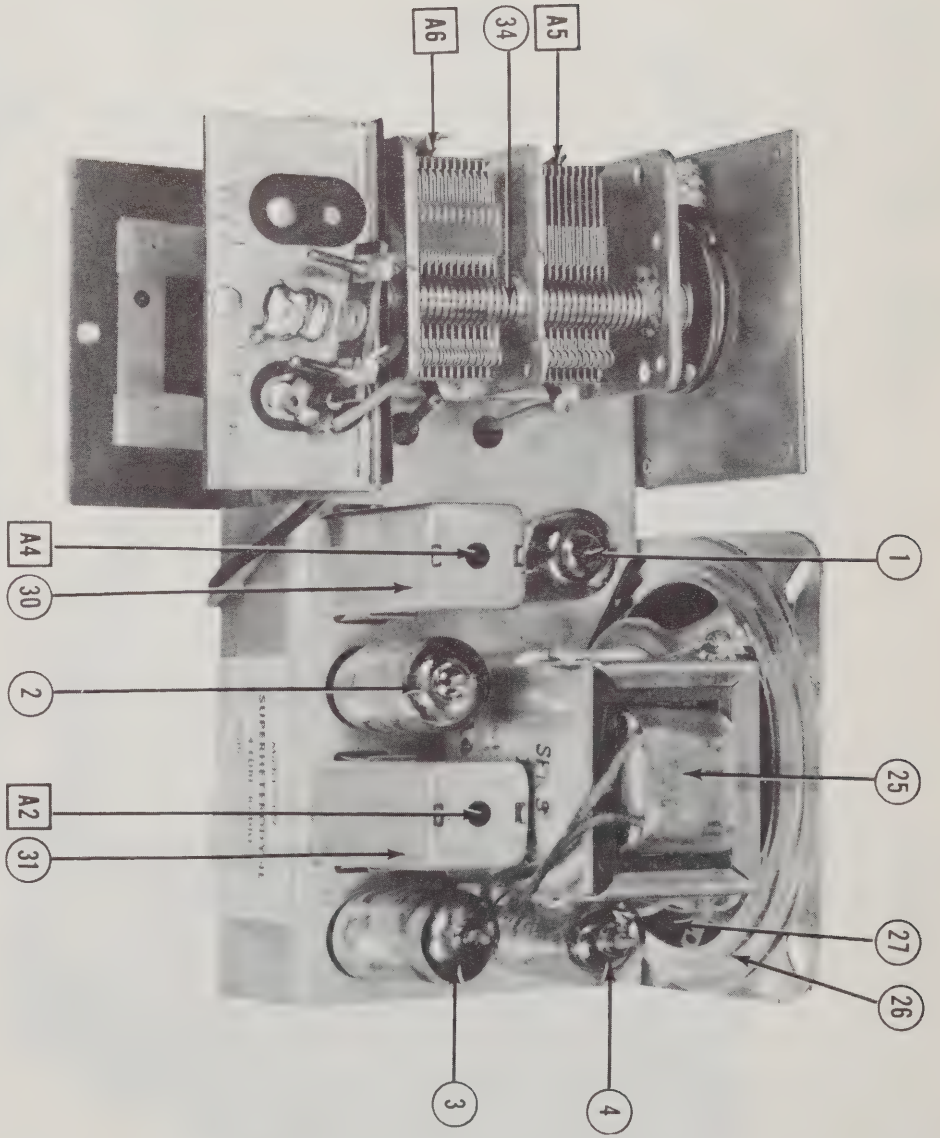
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21	1 Meg.	½	VC-11			Volume Control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	IDENTIFICATION CODES
22	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Oscillator Grid
23	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
24	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Line Isolation
25	10 Meg.	½	1R-3	BTS-10 Meg.	Br.-Blk.-Blue IF Grid
26	82KΩ	½	1R-31	BTS-82K	Gray-Red-Or. Diode RF Filter
27	10 Meg.	½	1R-3	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
28	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AF Screen Dropping
29	1 Meg.	½	1R-12	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
30	2.2 Meg.	½	1R-13	BTS-2.2 Meg.	Red-Red-Grn. Output Grid
31	270Ω	½	1R-33	BW-½-270	Red-Vi.-Br. Bias
32	620Ω	½	1R-39	BTS-560	Blue-Red-Br. Filament String
33	270Ω	½	1R-33	BW-½-270	Red-Vi.-Br. " "
34	33Ω	½	1R-17	BW-½-33	Or.-Or.-Blk. Filament Dropping
35	470Ω	2½	1R-1	BTS-470	Yl.-Vi.-Br. Filament String
36A	1050Ω	5	WR-7	AB-1000	Filament Dropping
B	1050Ω			AB-1000	" "
37	3900Ω	1	1R-40	BTA-3900	Or.-White-Red Filter
38	33Ω	½	1R-17		Or.-Or.-Blk. Rectifier Ballast
39	10KΩ	½	1R-37	BTS-10K	Br.-Blk.-Or. Screen Decoupling

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		KNIGHT PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
40	3700Ω	3.2Ω	410Ω	.7Ω	Part of SPK-8	A-3876*	T22346*	A-2900*	*Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			KNIGHT PART No.	JENSEN PART No.	QUAM PART No.	
41	FIELD PM	VC IMP. 3.2Ω	SPK-8			
42	CONE DIA. 3-7/16"	VC DIA. 9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	KNIGHT PART No.	MEISSNER PART No.
43	Loop Ant.		1.9Ω	LL14	
44	Osc. Coil	.3Ω	1Ω	LO8	14-1040
45	Input IF	22Ω	22Ω	LI5	16-6668
46	Output IF	22Ω	22Ω	LI5	16-6669

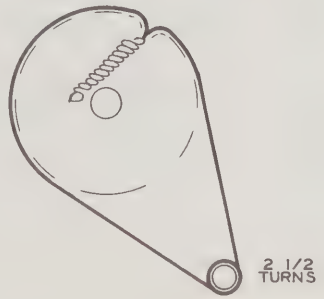
BATTERIES

ITEM No.	VOLTAGE	KNIGHT PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
47	3V "A"		#950			2R			2 Used in series
48	67.5V"B"			#467			XX45		

MISCELLANEOUS

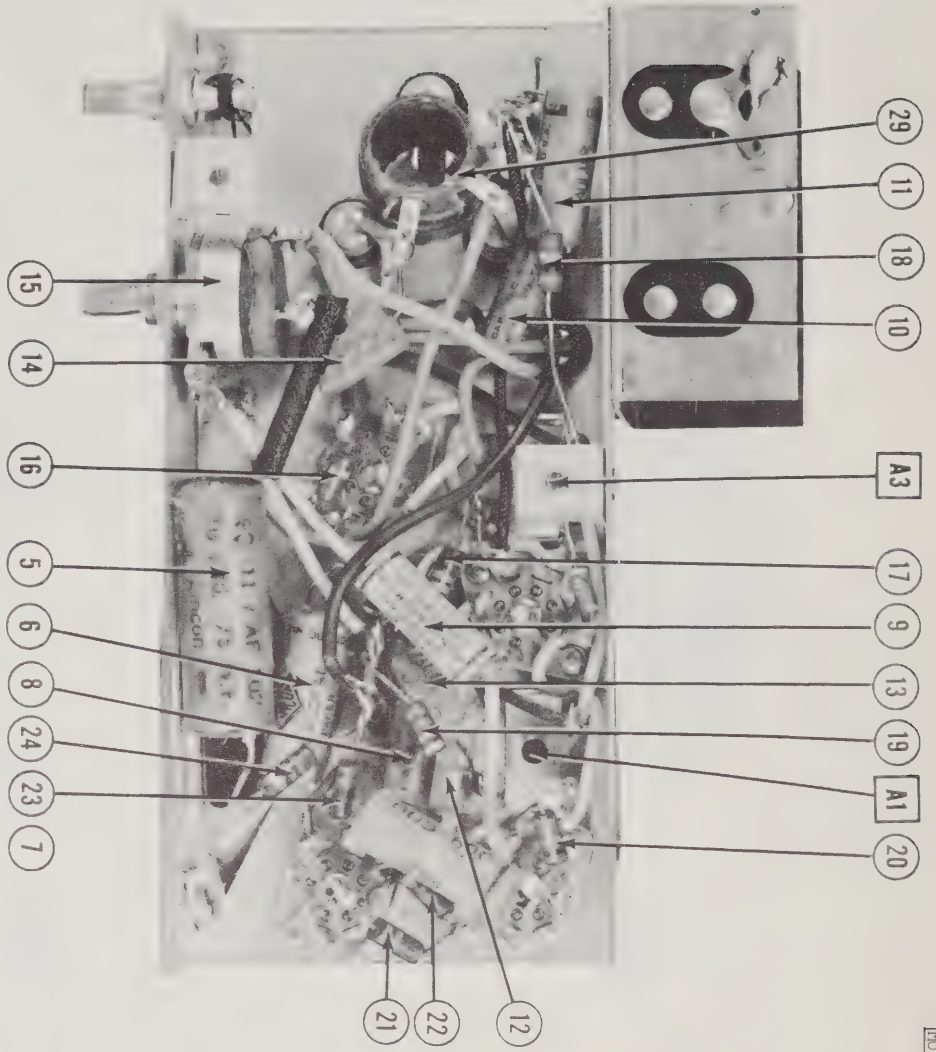
ITEM No.	PART NAME	KNIGHT PART No.	NOTES
49	Switch	SW-8	On-Off, AC-DC, Batt.
50	2 Gang Var. Cap.	GC-6X	(17-457MMF, 33-200MMF
A5	Trimmer	G-4	Osc. Adj.
A6	"	G-1	Ant. Adj.

TUNING GANG FULLY CLOSED

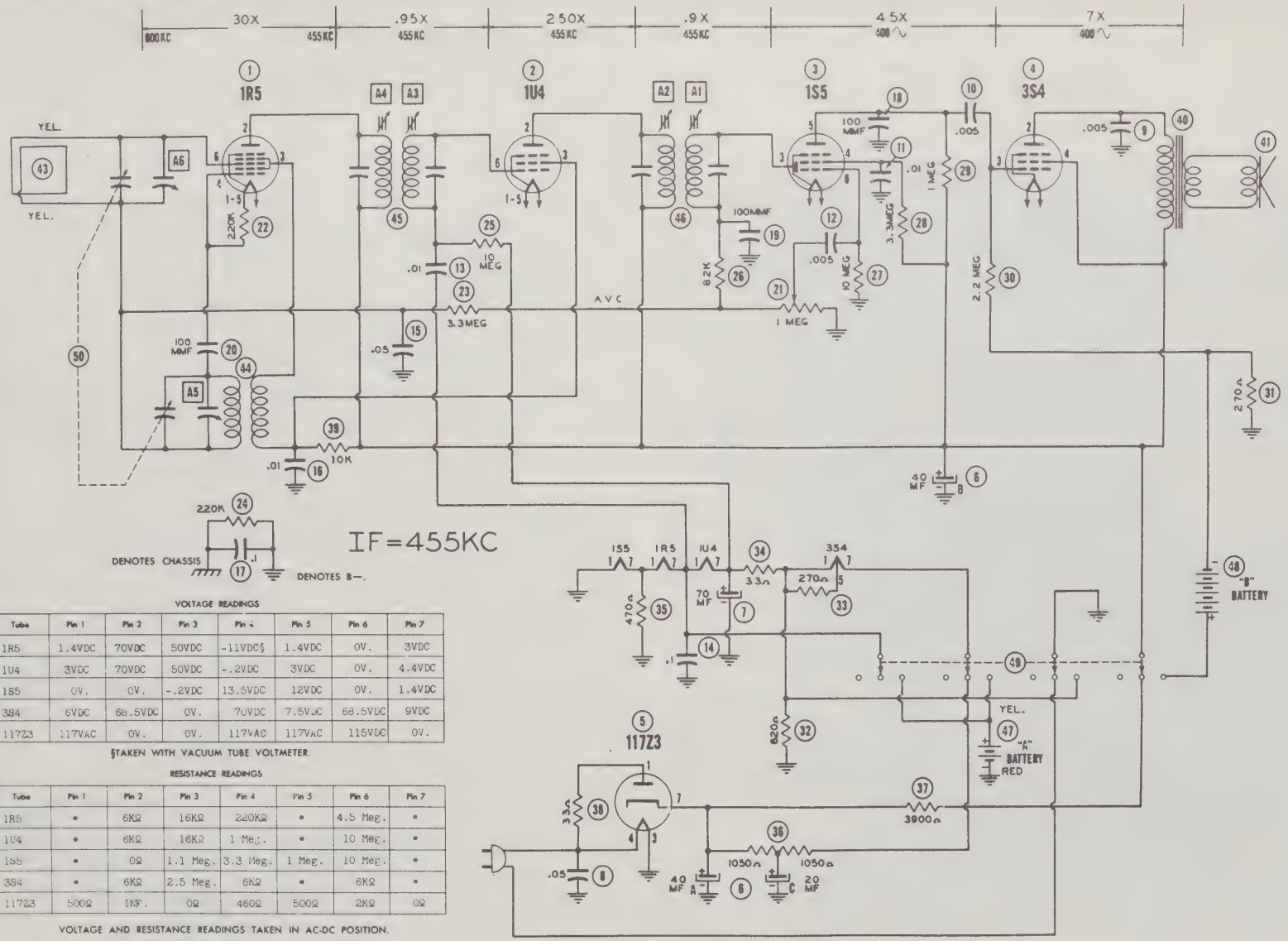


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



KNIGHT MODEL 5F-565



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	1.4VDC	70VDC	50VDC	-11VDC§	1.4VDC	0V.	3VDC
2	1U4	3VDC	70VDC	50VDC	-.2VDC	3VDC	0V.	4.4VDC
3	1S5	0V.	0V.	-.2VDC	13.5VDC	12VDC	0V.	1.4VDC
4	3S4	6VDC	68.5VDC	0V.	70VDC	7.5VDC	68.5VDC	9VDC
5	117Z3	117VAC	0V.	0V.	117VAC	117VAC	115VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	6KΩ	16KΩ	220KΩ	*	4.5 Meg.	*
2	1U4	*	6KΩ	16KΩ	1 Meg.	*	10 Meg.	*
3	1S5	*	0Ω	1.1 Meg.	3.3 Meg.	1 Meg.	10 Meg.	*
4	3S4	*	6KΩ	2.5 Meg.	6KΩ	*	6KΩ	*
5	117Z3	500Ω	INF.	0Ω	460Ω	500Ω	2KΩ	0Ω

VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.
*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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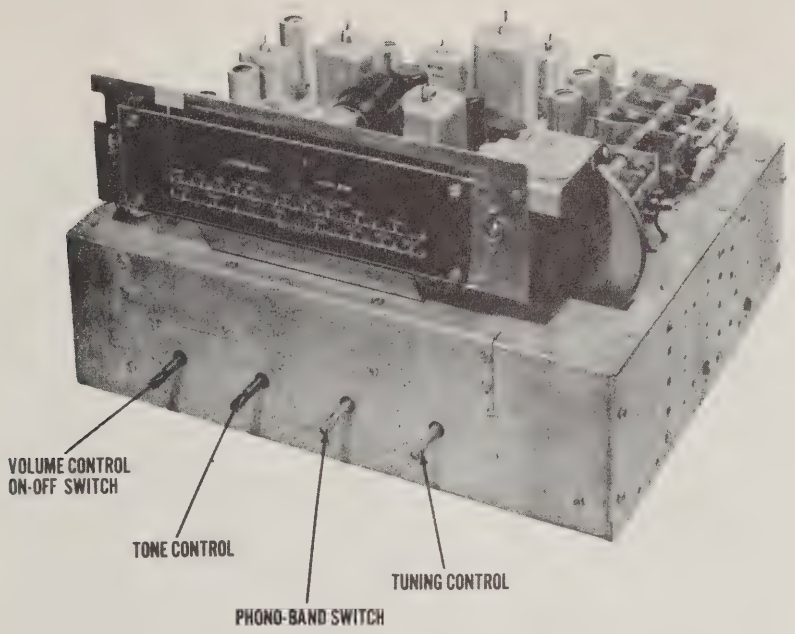
493-12

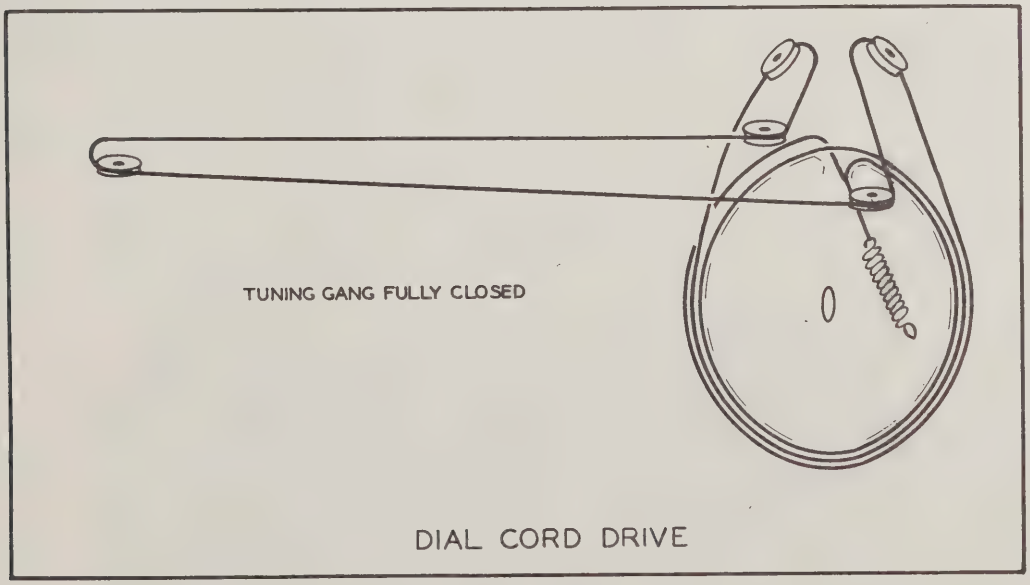
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to B-.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



MEISSNER MODEL 9-1093

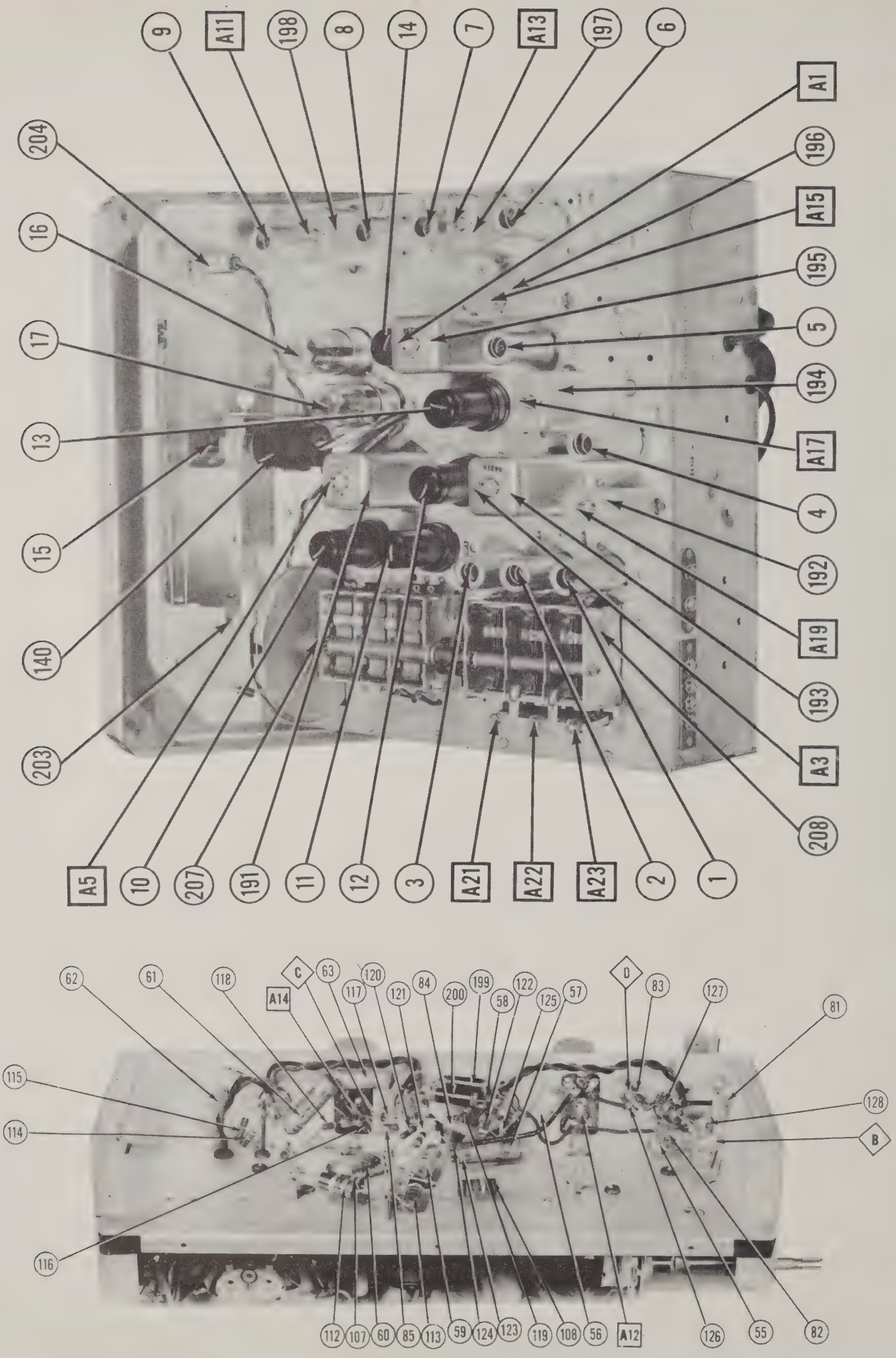
TRADE NAME	Meissner, Model 9-1093
MANUFACTURER	Meissner Mfg. Co., Div. of Maguire Industries Inc., Mt. Carmel, Ill.
TYPE SET	AC Operated AM-FM Superheterodyne Receiver
TUBES	(TWENTY-TWO) Types, 6AG5 FM 1st Conv., 6AG5, FM 2nd Conv., 6C4 FM Osc., 6AG5 FM 1st IF Amp., 6AG5 FM 2nd IF Amp., 6AG5 FM 3rd IF Amp., 9001 1st Limiter, 9001 2nd Limiter, 6AL5 Discriminator, 6SK7 AM RF Amp., 6SA7 AM Converter, 6SK7 AM 1st IF Amp., 6SK7 AM 2nd IF Amp., 6H6 AM Det.-AVC, 6U5/6G5 Tuning Indicator, 6E5 Tuning Indicator, 6J5GT 1st AF Amp., 6J5GT 2nd AF Amp., 6SN7GT 3rd AF-Inverter, (2) 6L6G Power Output 5Y3GT/G Rectifier, 5V4G Rectifier.
POWER SUPPLY	110-120 Volts AC — RATING 1.3 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC — FREQ. MOD. 88-108MC



DIAL CORD DRIVE

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1949 by Howard W. Sams & Co., Inc., Indianapolis 7, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2/49-#493-13 SET #55-FOLDER #13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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
1	FM 1st Conv.	6AG5	6AG5	7BD	
2	FM 2nd Conv.	6AG5	6AG5	7BD	
3	FM Osc.	6C4	6C4	6BG	
4	FM 1st IF Amp.	6AG5	6AG5	7BD	
5	FM 2nd IF Amp.	6AG5	6AG5	7BD	
6	FM 3rd IF Amp.	6AG5	6AG5	7BD	
7	1st Limiter	9001	9001	7PM	
8	2nd Limiter	9001	9001	7PM	
9	Discriminator	6AL5	6AL5	6BT	
10	AM RF Amp.	6SK7	6SK7	8N	
11	AM Conv.	6SA7	6SA7	8R	
12	AM 1st IF Amp.	6SK7	6SK7	8N	
13	AM 2nd IF Amp.	6SK7	6SK7	8N	
14	AM Det.-AVC	6H6	6H6	7Q	
15A	Tuning Indicator	6U5/6G5	6U5/6G5	6R	
B	" "	6E5	6E5	6R	
16	1st AF Amp.	6J5GT	6J5GT	6Q	
17	2nd AF Amp.	6J5GT	6J5GT	6Q	
18	3rd AF-Inv.	6SN7GT	6SN7GT	6BD	
19	Power Output	6L6G	6L6G	7AC	
20	" "	6L6G	6L6G	7AC	
21	Rectifier	5Y3GT/G	5Y3GT/G	5T	
22	"	5V4G	5V4G	5L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
23A	20	450	27171		QC2245*	DO-2x20-450*		Filter
B	20	450						"
24A	20	450	27171		QC2245*	DO-2x20-450*		"
B	20	450						"
25	10	450	28109	PRS450/10	BR1045	M-10-450	UT-12	
26	50	50	28106	PRS50/50	BR505	M-50-50	TA-550	Output Cathode Bypass
27	10	450	28109	PRS450/10	BR1045	M-10-450	UT-12	AF Decoupling
28	50	50	28106	PRS50/50	BR505	M-50-50	TA-550	AF Cathode Bypass
29	50	50	28106	PRS50/50	BR505	M-50-50	TA-550	" " "
30	.05	600	28172	684-05	GT6S5	ST-6-05	TC-15	Line Filter
31	.05	600	28172	684-05	GT6S5	ST-6-05	TC-15	" "
32	.01	600	28101	684-01	GT6S1	ST-6-01	TC-11	Audio Coupling
33	.01	600	28101	684-01	GT6S1	ST-6-01	TC-11	" "
34	.01	600	28101	684-01	GT6S1	ST-6-01	TC-11	" "
35	.01	600	28101	684-01	GT6S1	ST-6-01	TC-11	" "
36	.01	600	28101	684-01	GT6S1	ST-6-01	TC-11	" "
37	.03	400	28131	484-03	GT4S3	ST-4-03	TC-13	Tone Compensation-Note 1
38	.002	600	28150	684-002	GT6D2	ST-6-002	TC-22	" "
39	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
40	.02	400	28117	484-02	GT4S2	ST-4-02	TC-12	Phono Tone Comp.
41	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	AVC Filter
42	.05	400	28103	484-05	GT4S5	ST-4-05	TC-15	2nd AM IF Plate Decoup.
43	.05	400	28103	484-05	GT4S5	ST-4-05	TC-15	2nd AM IF Screen Byp.
44	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	2nd AM IF Cath. Byp.
45	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
46	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	1st AM IF Cath. Bypass
47	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
48	.05	400	28103	484-05	GT4S5	ST-4-05	TC-15	AM Conv. Screen Bypass
49	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
50	.05	400	28103	484-05	GT4S5	ST-4-05	TC-15	AM RF Plate Decoupling
51	.1	600	28112	684-.1	GT6P1	ST-6-1	TC-1	Screen Decoupling
52	.05	200	28104	484-05	GT2S5	ST-4-05	TC-15	AM RF Cathode Bypass
53	.05	400	28103	484-05	GT4S5	ST-4-05	TC-15	AVC Filter
54	.1	600	28112	684-.1	GT6P1	ST-6-1	TC-1	RF Bypass Pwr. Supply
55	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	Filament Bypass
56	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd Lim. Plate Decoup.
57	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd Lim. Screen Bypass
58	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	1st Lim. Screen Bypass
59	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	Decoupling
60	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	AVC Filter
61	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	3rd FM IF Decoupling
62	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	3rd FM IF Cathode Byp.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
118	2.2 Meg.	½	RC20AE225K	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
119	22KΩ	½	RC20AE223K	BTS-22K	Red-Red-Or. Bleeder
120	22KΩ	½	RC20AE223K	BTS-22K	Red-Red-Or. 1st Limiter Screen Dropping
121	10KΩ	½	RC20AE103M	BTS-10K	Br.-Blk.-Or. 1st Limiter Plate Load
122	150KΩ	½	RC20AE154M	BTS-150K	Br.-Grn.-Yl. 2nd Limiter Grid
123	22KΩ	½	RC20AE223K	BTS-22K	Red-Red-Or. 2nd Limiter Screen Dropping
124	1500Ω	½	RC20AE152M	BTS-1500	Br.-Grn.-Red 2nd Limiter Plate Decoupling
125	22KΩ	½	RC20AE223K	BTS-22K	Red-Red-Or. Bleeder
126	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. Discriminator Diode Load
127	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. " " "
128	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. De-emphasis
129	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. AVC Network
130	470Ω	1	RC20AE471M	BTS-470	Yl.-Vi.-Br. AM-RF Cathode
131	47KΩ	1	RC30AE473M	BTA-47K	Yl.-Vi.-Or. Screen Dropping
132	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red AM-RF Plate Decoupling
133	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. AVC Network
134	22KΩ	½	RC20AE223K	BTS-22K	Red-Red-Or. AM Oscillator Grid
135	18KΩ	2	RC40AE183K	BT-2-18K	Br.-Gray-Or. AM Conv. Screen Dropping
136	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
137	470Ω	½	RC20AE471M	BTS-470	Yl.-Vi.-Br. AM 1st IF Cathode
138	470Ω	½	RC20AE471M	BTS-470	Yl.-Vi.-Br. AM 2nd IF Cathode
139	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. AM 2nd IF Screen Dropping
140	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red AM 2nd IF Plate Decoupling
141	2.2 Meg.	½	RC20AE225K	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
142	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. Diode RF Filter
143	82KΩ	½	RC20AE823K	BTS-82K	Gray-Red-Or. Diode Load
144	25KΩ	1	15193	BTA-27K	Red-Grn.-Or. Voltage Dropping-See Note 3
145	47KΩ	1	RC30AE473M	BTA-47K	Yl.-Vi.-Or. " " " " 4
146	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. Tuning Indicator Plate Load-Note 5
147	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. Tone Compensation
148	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. Phono Tone Compensation
149	470KΩ	½	RC20AE474K	BTS-470K	Yl.-Vi.-Yl. AVC Network
150	680KΩ	½	RC20AE684M	BTS-680K	Blue-Gray-Yl. AVC Network
151	82KΩ	½	RC20AE823K	BTS-82K	Gray-Red-Or. Tone Compensation
152	4700Ω	½	RC20AE472M	BTS-4700	Yl.-Vi.-Red 1st AF Cathode
153	3300Ω	½	RC20AE332K	BTS-3300	Or.-Or.-Red 1st AF Plate Load
154	470KΩ	½	RC20AE474K	BTS-470K	Yl.-Vi.-Yl. 2nd AF Grid
155	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 2nd AF Cathode
156	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. 2nd AF Plate Load
157	27KΩ	1	RC30AE273M	BTA-27K	Red-Vi.-Or. AF Decoupling
158	100Ω Var.	1	29314	ABA-100	Hum Balance
159	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. 3rd AF Grid
160	2200Ω	½	RC20AE222J	BTS-2200	Red-Red-Red 3rd AF Cathode
161	100KΩ	½	RC20AE104K	BTS-100K	Br.-Blk.-Yl. 3rd AF Plate Load
162	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. Phase Inverter Grid
163	2700Ω	½	RC20AE272J	BTS-2700	Red-Vi.-Red Phase Inverter Cathode
164	47KΩ	½	RC20AE473J	BTS-47K	Yl.-Vi.-Or. " " "
165	47KΩ	½	RC20AE473J	BTS-47K	Yl.-Vi.-Or. Phase Inverter Plate Load
166	470KΩ	½	RC20AE474K	BTS-470K	Yl.-Vi.-Yl. Output Grid
167	470KΩ	½	RC20AE474K	BTS-470K	Yl.-Vi.-Yl. " "
168	220Ω	5	28135	ABA-250	Output Cathode-See Note 6
169	12KΩ	2	RC40AE123K	BT-2-12K	Br.-Red-Or. Output Cathode Bias
170	12KΩ	2	RC40AE123K	BT-2-12K	Br.-Red-Or. " " "
171	2700Ω	2	RC40AE272K	BT-2-2700	Red-Vi.-Red Voltage Dropping
172	2700Ω	2	RC40AE272K	BT-2-2700	Red-Vi.-Red " "
173	3300Ω	½	RC20AE332J	BTS-3300	Or.-Or.-Red Feedback
174	250Ω	10	24194	AB-250	Surge Limiter
175	82Ω	2	28123	BW-2-82	Gray-Red-Blk. Rectifier Ballast
176	82Ω	2	28123	BW-2-82	Gray-Red-Blk. " "

Note 3-Some models use 150KΩ in this application. IRC replacement same as Item #122.
Note 4-Some models use 330KΩ in this application. IRC replacement BTS-330K.
Note 5-Some models use 470KΩ in this application. IRC replacement same as Item 149.
Note 6-On IRC replacement set slider at 220Ω from one end.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.	REPLACEMENT DATA: MERIT PART No.
177	117V AC @ .85A	760V CT 1.153A DC	5.0V AC @ 2.0A	5.0V AC @ 2.0A	29225		T49815A	

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MEISSNER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
63	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	Filament Bypass
64	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd FM IF Decoupling
65	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd FM IF Cathode Bypass
66	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	1st FM IF Decoupling
67	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	AVC Filter
68	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd Conv. Plate Decoup.
69	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd Conv. Screen Byp.
70	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	2nd Conv. Cath. Byp.
71	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	Filament Bypass
72	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	" "
73	.01	400	28119	484-01	GT4S1	ST-4-01	TC-11	RF Bypass Pwr. Supply-See Note 2
74	100	500	CM20A101M	1468-0001	5W5T1	MO.5-31	1FM-31	AM-IF Coupling
75	100	500	CM20A101M	1468-0001	5W5T1	MO.5-31	1FM-31	AM Diode RF Filter
76	100	500	CM20A101M	1468-0001	5W5T1	MO.5-31	1FM-31	AM Diode RF Filter
77	47	500	CM20A470M	1468-00005	5W5Q5	MO.5-45	1FM-45	AM Osc. Grid
78	330	500	CM20A331K					Fixed Trimmer
79	82	500	CM20A820K					" "
80	130	500						" "
81	200	500	CM20A201J	1468-0002	5W5T2	MO.5-32	1FM-32	De-emphasis
82	50	300	27166	1469-45	5R5Q5	MOS.5-45	MS-45	RF Bypass Cer.
83	50	300	27166	1469-45	5R5Q5	MOS.5-45	MS-45	" " "
84	25	300	27165	1468-000025	5W5Q25	MO.5-425	1FM-425	FM-IF Coupling "
85	50	300	27166	1468-00005	5W5Q5	MO.5-45	1FM-45	Limiter Grid "
86	470	500	CM20C471K	1468-0005	5W5T5	MO.5-35	1FM-35	RF Coupling
87	1000	300	CM30A102K	1464-001	2R5D1	MWS.5-21	MS-21	Fixed Pad
88	470	500	CM20C471K	1468-0005	5W5T5	MO.5-35	1FM-35	1st FM Conv. Plate Decoup.
89	1	300	28151	1468-000001				Osc. Coupling "
90	15	300	28128				MS-415	" " "
91	1000	300	CM30A102M	1468-001	1W5D1	MW.5-21	1FM-21	1st FM Conv. Screen
92	4700	300	CM35A472M	1467-005	1D5D5	MW.5-25	1FM-25	Filament Bypass
93	25	300	27165	1469-000025	5R5Q25	MOS.5-425	MS-425	Osc. Grid Cap. "
94	200	500	CM20A201J	1468-0002	5W5T2	MO.5-32	1FM-32	Osc. Feedback

*Install new mounting socket.
Note 1-Some models may use a .01 MFD and a .02 MFD cap. in parallel.
Note 2-Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MEISSNER PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
95A	1 Meg.	½	29243	D19-137X	AT-112	Volume Control tapped @ 500KΩ
B	Shaft		Not Req.	E	KSS-3	Attach to 95A per instructions
C	Switch		" "	41	SW-A	" " " " "
96A	1 Meg.	½	29242	D11-137	AM-61-S	Tone Control
B	Shaft		Not Req.	E	KSS-3	Attach to 96A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MEISSNER PART No.	IRC PART No.	IDENTIFICATION CODES
97	33KΩ	½	RC20AE333K	BTS-33K	Or.-Or.-Or. FM Oscillator Grid
98	6800Ω	1	RC30AE682K	BTA-6800	Blue-Gray-Red FM Oscillator Plate Load
99	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red FM 1st Converter Cathode
100	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. FM 1st Conv. Screen Dropping
101	4700Ω	½	RC20AE472M	BTS-4700	Yl.-Vi.-Red FM 1st Conv. Plate Decoupling
102	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. FM 2nd Conv. Grid
103	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red FM 2nd Conv. Cathode
104	220KΩ	½	RC20AE224M	BTS-220K	Red-Red-Yl. FM 2nd Conv. Screen Dropping
105	4700Ω	½	RC20AE472M	BTS-4700	Yl.-Vi.-Red FM 2nd Conv. Plate Decoup.
106	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. AVC Network
107	680Ω	2	RC40AE681K	BT-2-680	Blue-Gray-Br. Decoupling
108	680Ω	2	RC40AE681K	BT-2-680	Blue-Gray-Br. "
109	10KΩ	1	RC30AE103M	BTA-10K	Br.-Blk.-Or. FM 1st IF Decoupling
110	10KΩ	1	RC30AE103M	BTA-10K	Br.-Blk.-Or. FM 2nd IF Decoupling
111	120Ω	½	RC20AE121K		Br.-Red-Br. FM 1st IF Cathode
112	2700Ω	2	RC40AE272K	BT-2-2700	Red-Vi.-Red Decoupling
113	2200Ω	2	RC40AE222K	BT-2-2200	Red-Red-Red "
114	3300Ω	½	RC20AE332K	BTS-3300	Or.-Or.-Red FM 3rd IF Transformer Shunt
115	120Ω	½	RC20AE121K		Br.-Red-Br. FM 3rd IF Cathode
116	1500Ω	½	RC20AE152M	BTS-1500	Br.-Grn.-Red FM 3rd IF Decoupling
117	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. 1st Limiter Grid

DATE 2/43-#493-13 SET #55-FOLDER #13

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MEISSNER PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
178	117V AC @ .45A	6.3V AC @ 4.85A	6.6V AC @ 2.4A		29231	P-6333†	T49792A	P-2946 and P-2947‡

†Drill new mounting holes.
‡Mount P-2947 above chassis, P-2946 below chassis. Drill new mounting holes.

FILTER CHOKE

ITEM NO.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA MEISSNER PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	INSTALLATION NOTES
179	.058A	275Ω	10 Henries	29230	C-1709	T20C53	C-2990	‡Drill one new mtg. hole.
180	.058A	275Ω	10 Henries	29230	C-1709	T20C53	C-2990‡	
181	.095A	75Ω	4.5 Henries		C-2304	T49950		

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MEISSNER PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
182	8750Ω CT	12Ω	393Ω CT	.9Ω	29229	A-3304†§	T49789†	A-3130†	†Drill new mounting holes. §Use 10,000Ω tap on pri. and 15Ω tap on sec.

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MEISSNER PART No.	MEISSNER PART No.
183	Loop Ant.BC		.1Ω	04751	
184	FM Dipole		0Ω	04942	
185	Ant.Coil BC	39Ω .5Ω	2.8Ω	04832	
186	" " FM	0Ω	0Ω	04883	
187	RF Coil BC	53Ω	5Ω	04833	
188	" " FM		0Ω	04885	
189	Osc.Coil BC		6Ω	04834	
190	" " FM		0Ω	04884	
191	1st IF AM	6.7Ω	7Ω	04216	
192	" " FM	.8Ω	.8Ω	04193	16-6665
193	2nd IF AM	6.7Ω	7Ω	04216	
194	" " FM	.8Ω	.8Ω	04193	16-6665
195	3rd IF AM	6Ω	6.7Ω	04238	
196	" " FM	.8Ω	.8Ω	04193	16-6665
197	4th IF FM	.8Ω	.8Ω	04193	16-6665
198	FM Det.Tran.	.8Ω	1Ω	04194	17-3484
199	Fil. Choke		.5Ω	04588	
200	" "		.5Ω	04588	
201	" "		.5Ω	04588	
202	" "		.5Ω	04588	

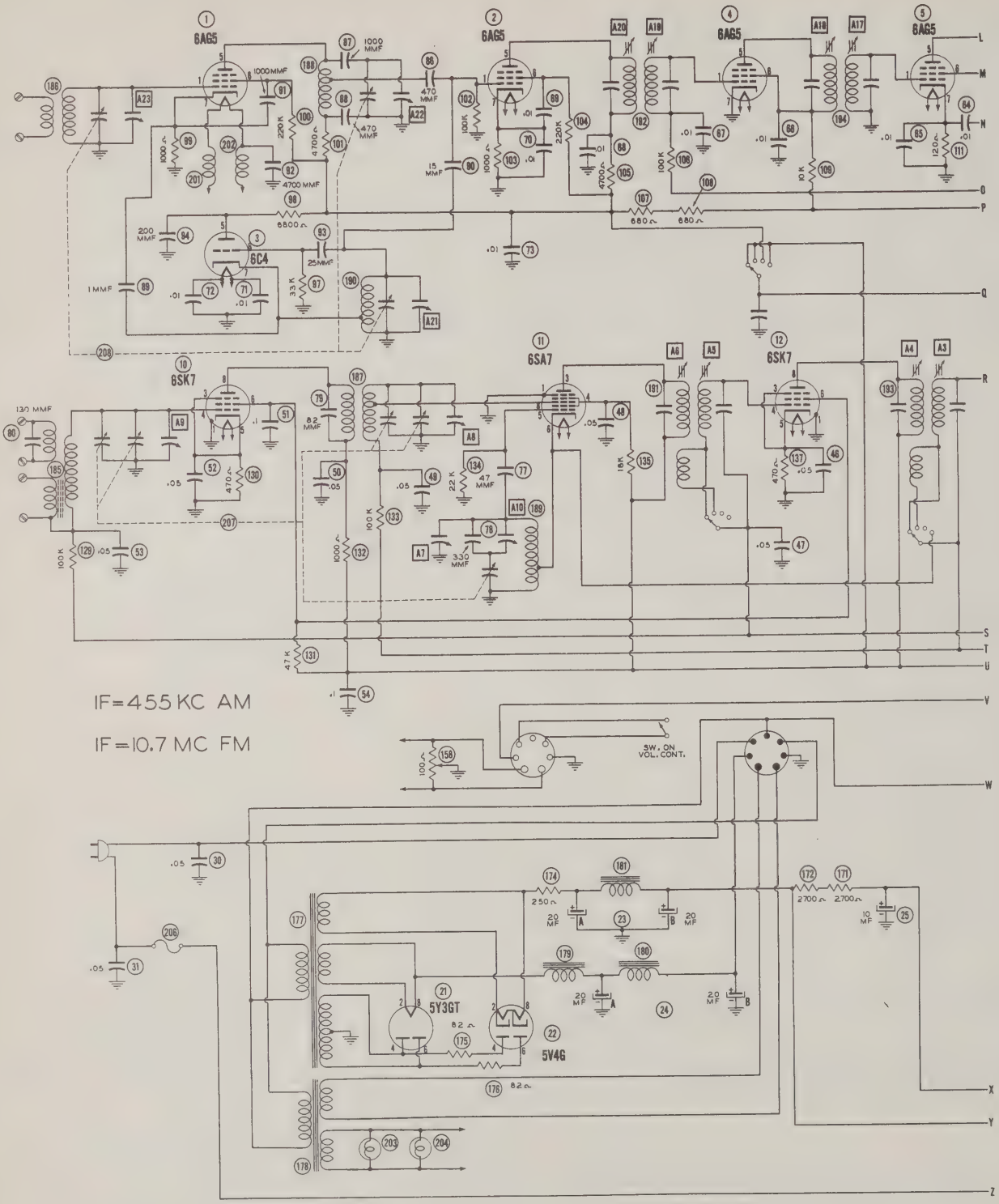
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA MEISSNER PART No.		INSTALLATION NOTES
203	Bayonet	6-8	0.25	Blue	19370		Type #44
204	"	6-8	0.25	"	19370		" "

MISCELLANEOUS

ITEM No.	PART NAME	MEISSNER PART No.	NOTES
205	Switch		Function
206	Fuse		3 Amp.
207	3 Gang Var. Cap. (AM)	28108	(22-464MMF, 19-467MMF, 11-222MMF)
208	3 Gang Var. Cap. (FM)	28107	

MEISSNER
MODEL 9-1093 PAGE 5



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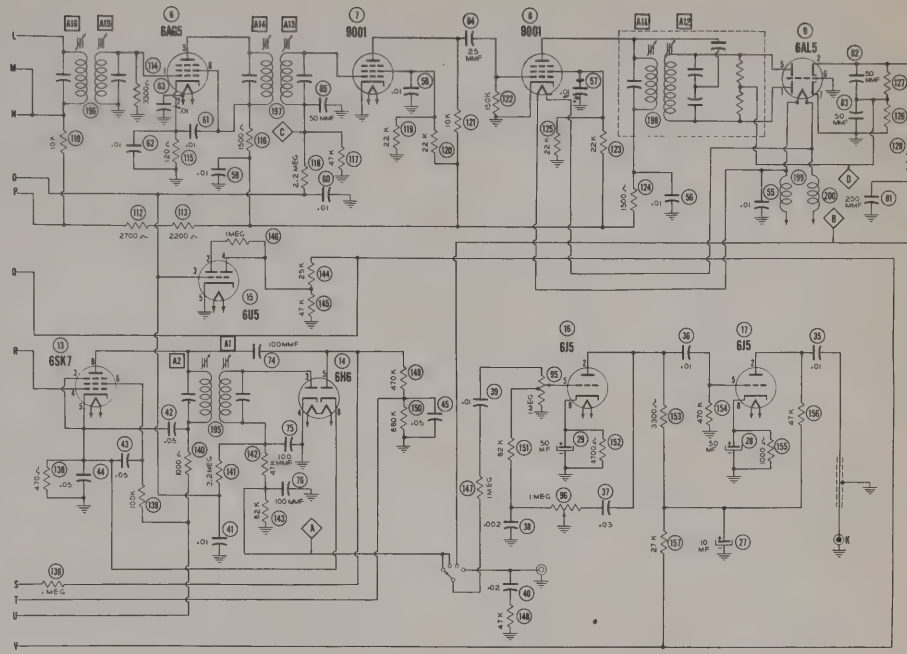

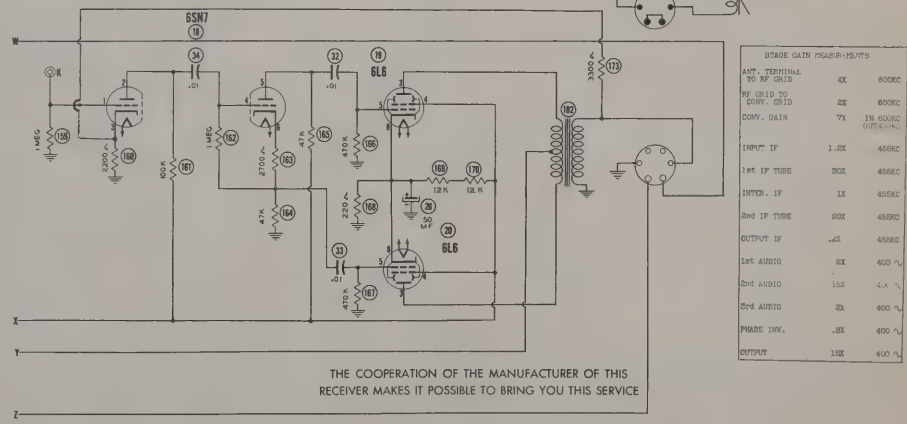

STAGE GAIN MEASUREMENTS		
ANT. TERMINAL TO RF GRID	4X	600KC
RF GRID TO CONV. GRID	2X	600KC
CONV. GAIN	7X	IN 600KC OUTPUT
INPUT IF	1.2X	455KC
1st IF TUBE	30X	455KC
INTER. IF	1X	455KC
2nd IF TUBE	20X	455KC
OUTPUT IF	.4X	455KC
1st AUDIO	8X	400 ~
2nd AUDIO	15X	400 ~
3rd AUDIO	2X	400 ~
PHASE INV.	.8X	400 ~
OUTPUT	15X	400 ~

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

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VOLTAGE AND RESISTANCE READINGS TAKEN WITH SELECTOR SWITCH IN HI FI POSITION.
VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡	1	6AG5	0V.	3VDC	3.2VAC	3.3VAC	260VDC	140VDC	3VDC	-
‡	2	6AG5	0V.	2.3VDC	3.2VAC	3.3VAC	260VDC	1.5VDC	2.3VDC	-
‡	3	6C4	200VDC	0V.	3.2VAC	3.2VAC	200VDC	-6VDC§	0V.	-
‡	4	6AG5	-.2VDC	0V.	3.2VAC	3.2VAC	130VDC	130VDC	0V.	-
‡	5	6AG5	0V.	1VDC	3.3VAC	3.3VAC	120VDC	120VDC	1VDC	-
‡	6	6AG5	0V.	1VDC	3.2VAC	3.2VAC	115VDC	115VDC	1VDC	-
‡	7	9001	-.1VDC	0V.	3.2VAC	3.2VAC	115VDC	50VDC	0V.	-
‡	8	9001	-.3VDC	0V.	3.2VAC	3.2VAC	135VDC	55VDC	0V.	-
‡	9	6AL5	0V.	-1.7VDC	3.2VAC	3.2VAC	.2VDC	0V.	-1VDC	-
	10	6SK7	0V.	3.2VAC	4.0VDC	-.6VDC	4.5VDC	120VDC	3.2VAC	280VDC
	11	6SA7	0V.	3.2VAC	280VDC	120VDC	-10.5VDC	0V.	3.2VAC	0V
	12	6SK7	0V.	3.2VAC	4.2VDC	0V.	4.2VDC	120VDC	3.2VAC	280VDC
	13	6SK7	0V.	3.2VAC	3.5VDC	0V.	3.5VDC	100VDC	3.2VAC	280VDC
	14	6H6	0V.	3.2VAC	0V.	3.5VDC	-.2VDC	0V.	3.2VAC	0V.
	15	6U5/6GT	-	-	-	-	-	-	-	-
	16	6J5GT	0V.	3.2VAC	185VDC	190VDC	0V.	190VDC	3.3VAC	8.1VDC
	17	6J5GT	0V.	3.2VAC	75VDC	0V.	0V.	175VDC	3.3VAC	1.1VDC
	18	6SN7GT	0V.	85VDC	1.6VDC	40VDC	205VDC	90VDC	**	**
	19	6L6G	0V.	**	380VDC	280VDC	0V.	0V.	**	21VDC
	20	6L6G	0V.	**	380VDC	280VDC	0V.	0V.	**	21VDC
	21	5Y3GT	0V.	360VDC	0V.	380VAC	0V.	380VAC	0V.	360VDC
	22	5V4G	0V.	420VDC	0V.	380VAC	0V.	380VAC	0V.	420VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

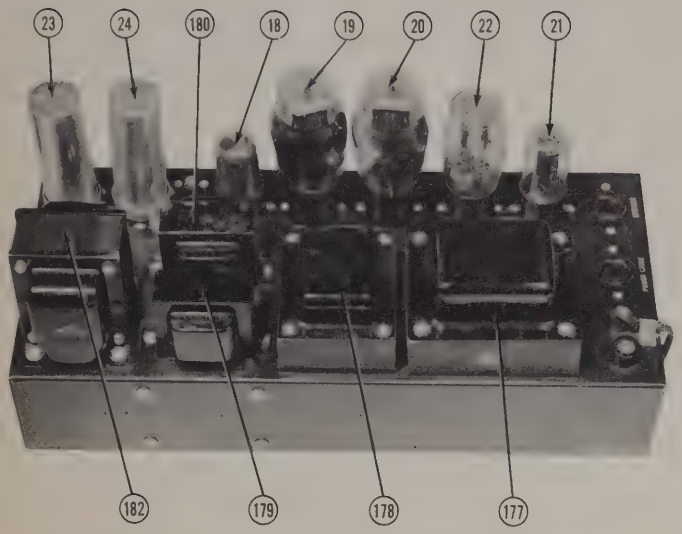
RESISTANCE READINGS

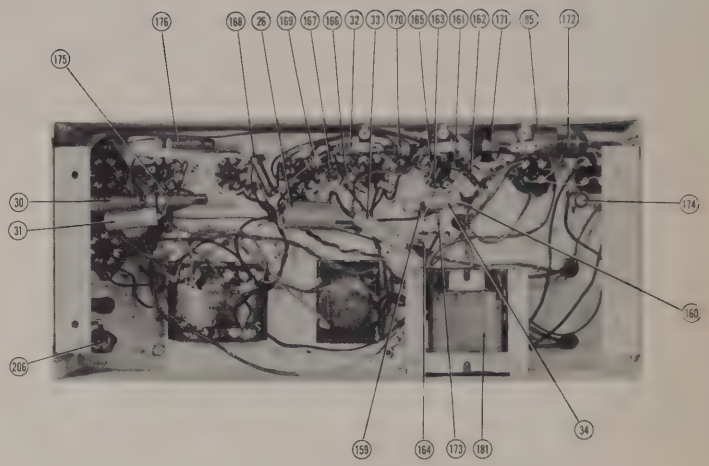
	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
‡	1	6AG5	0Ω	1KΩ	25Ω	25Ω	75KΩ	290KΩ	1KΩ	-
‡	2	6AG5	100KΩ	1KΩ	25Ω	25Ω	75KΩ	310KΩ	1KΩ	-
‡	3	6C4	75KΩ	INF.	25Ω	25Ω	75KΩ	33KΩ	0Ω	-
‡	4	6AG5	1.5 Meg.	0Ω	25Ω	25Ω	82KΩ	82KΩ	[illegible]	-
‡	5	6AG5	.8Ω	120Ω	25Ω	25Ω	84KΩ	84KΩ	1KΩ	-
‡	6	6AG5	.8Ω	120Ω	25Ω	25Ω	74KΩ	75KΩ	1KΩ	-
‡	7	9001	50KΩ	0Ω	25Ω	25Ω	29KΩ	17KΩ	0Ω	-
‡	8	9001	150KΩ	0Ω	25Ω	25Ω	14KΩ	15KΩ	0Ω	-
‡	9	6AL5	0Ω	160KΩ	25Ω	25Ω	200KΩ	INF.	160KΩ	-
	10	6SK7	0Ω	25Ω	470Ω	2.5 Meg.	470Ω	110KΩ	25Ω	7.2KΩ
	11	6SA7	0Ω	25Ω	70KΩ	90KΩ	22KΩ	1Ω	25Ω	90KΩ
	12	6SK7	0Ω	25Ω	470Ω	2.5 Meg.	470Ω	110KΩ	25Ω	70KΩ
	13	6SK7	0Ω	25Ω	470Ω	68OKΩ	470Ω	180KΩ	25Ω	7.2KΩ
	14	6H6	0Ω	25Ω	1.2 Meg.	470Ω	120KΩ	850KΩ	25Ω	0Ω
	15	6U5/6G5	-	-	-	-	-	-	-	-
	16	6J5GT	0Ω	25Ω	100KΩ	100KΩ	800KΩ	100KΩ	25Ω	4.7KΩ
	17	6J5GT	0Ω	25Ω	150KΩ	1.2 Meg.	470KΩ	50KΩ	25Ω	1KΩ
**	18	6SN7GT	1 Meg.	120KΩ	2.2KΩ	1 Meg.	70KΩ	50KΩ	INF.	INF.
**	19	6L6G	0Ω	INF.	30KΩ	36KΩ	470KΩ	INF.	INF.	2[illegible]
**	20	6L6G	0Ω	INF.	30KΩ	36KΩ	470KΩ	INF.	INF.	2[illegible]
	21	5Y3GT	INF.	70KΩ	0Ω	80Ω	INF.	70Ω	INF.	70KΩ
	22	5V4G	INF.	30KΩ	INF.	160Ω	INF.	150Ω	INF.	30KΩ

**VOLTAGE ACROSS FILAMENT TERMINALS IS 6.6VAC.
‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.





ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

AM ALIGNMENT

In Steps 1, 2 & 3 use frequency modulated signal with 60 ∿ modulation and 40KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 1 (grid) of 6SK7 2nd IF Tube (13). Low side to chassis.	455KC (Freq. Mod. 40KC sweep)	AM "Sharp" (fully counter-clock-wise)	Tuning cap. fully open.	Vertical input to Point ⏚. Ground to chassis.	A1,A2	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
2	.1 MFD.	High side to Pin 1 (grid) of 6SK7 1st IF Tube (12) Low side to chassis.	"	"	"	"	A3,A4	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Turn bandswitch to AM "Hi F1" (one position clockwise). Pattern should still be symmetrical about 455KC. Return switch to AM "Sharp".
3	.1 MFD.	High side to Pin 8 (grid) of 6SA7. Low side to chassis.	"	"	"	"	A5,A6	"
						OUTPUT METER		
4	200 MMFD	High side to AM ant. terminal A3. Low side to chassis.	1550KC	AM "Sharp" (fully counter-clock-wise)	1550KC	Across voice coil	A7	Adjust for maximum output
5	200 MMFD	"	"	"	Tune for maximum output.	"	A8,A9	" " " "
6	200 MMFD	"	580KC	"	"	"	A10	Rock tuning cap. and adjust for maximum output. Repeat Steps 4, 5 & 6 until no further improvement can be made.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7	5000MMF Mica Cap	High side to Pin 1 (grid) of 9001 1st Limiter (7). Low side to chassis.	10.7MC (Freq. Modulated)	FM (2 positions clock-wise)	Tuning cap. fully open.	Vertical input to Point ⏚. Ground to chassis.	A11, A12	Remove 6AG5 2nd IF Tube (5) from its socket. Alternately adjust A11 for maximum amplitude and straightness of crossover lines and A12 for centering of crossover lines on scope horizontal sweep line per Fig. 3. Replace 2nd IF Tube.
8	5000MMF. Mica Cap	High side to Pin 1 (grid) of 6AG5 2nd IF Tube (5). Low side to chassis.	"	"	"	Vertical input to Point ⏚. Ground to chassis.	A13, A14, A15, A16	Remove second limiter 9001 tube (8). Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 2.
9	5000MMF Mica Cap	High side to Pin 1 (grid) of 6AG8 1st IF Tube (4). Low side to chassis.	"	"	"	"	A17, A18	"
10	5000MMF. Mica Cap	High side to Pin 1 (grid) of 6AG8 2nd FM Conv. (2). Low side to chassis.	"	"	"	"	A19, A20	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	5000MMF. Mica Cap.	High side to Pin 1 (grid) of 9001 1st Lim. Tube (7). Low side to chassis.	10.7MC (Unmodulated)	FM (2 positions clock-wise)	Tuning cap. fully open.	DC probe to Point ⏚. Common to chassis	A11	Remove 6AG5 2nd IF Tube (5) from its socket. Adjust for maximum deflection.
8	"	"	"	"	"	DC probe to Point ⏚. Common to chassis	A12	Adjust for zero deflection. Replace 2nd IF Tube.
9	"	Across FM ant. terminals.	"	"	"	DC probe to Point ⏚. Common to chassis	A13,A14 A15,A16 A17,A18 A19,A20	Remove 2nd Limiter 9001 Tube (8). Adjust for maximum deflection. Continue with FM-RF Alignment in Step 11.

FM RF ALIGNMENT

Use dummy antenna and coupling transformer constructed as shown in sketch.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11	2 150Ω carbon res.(see preallignment notes)	Across dipole terminals.	108MC (Unmodulated)	FM	108MC	DC probe to Point ⏚. Common to chassis	A21	Adjust for maximum deflection.
12	"	"	"	"	Tune for maximum deflection.	"	A22, A23	Rock tuning cap. and adjust for maximum deflection. Repeat Steps 11 & 12 until no further improvement can be made. Replace 2nd Limiter 9001 Tube 8.

DETAILS OF DUMMY ANTENNA AND 1:1 COUPLING TRANSF. TO GIVE BALANCED OUTPUT

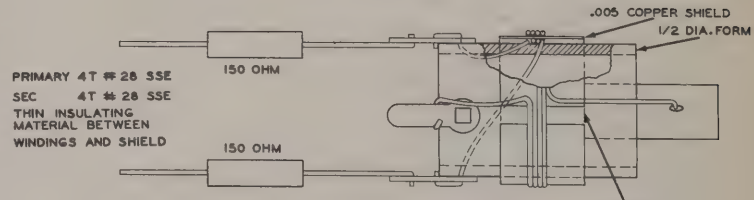


FIG. 1

FIG. 2

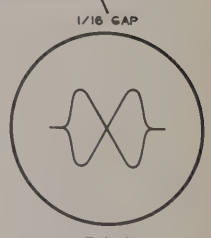
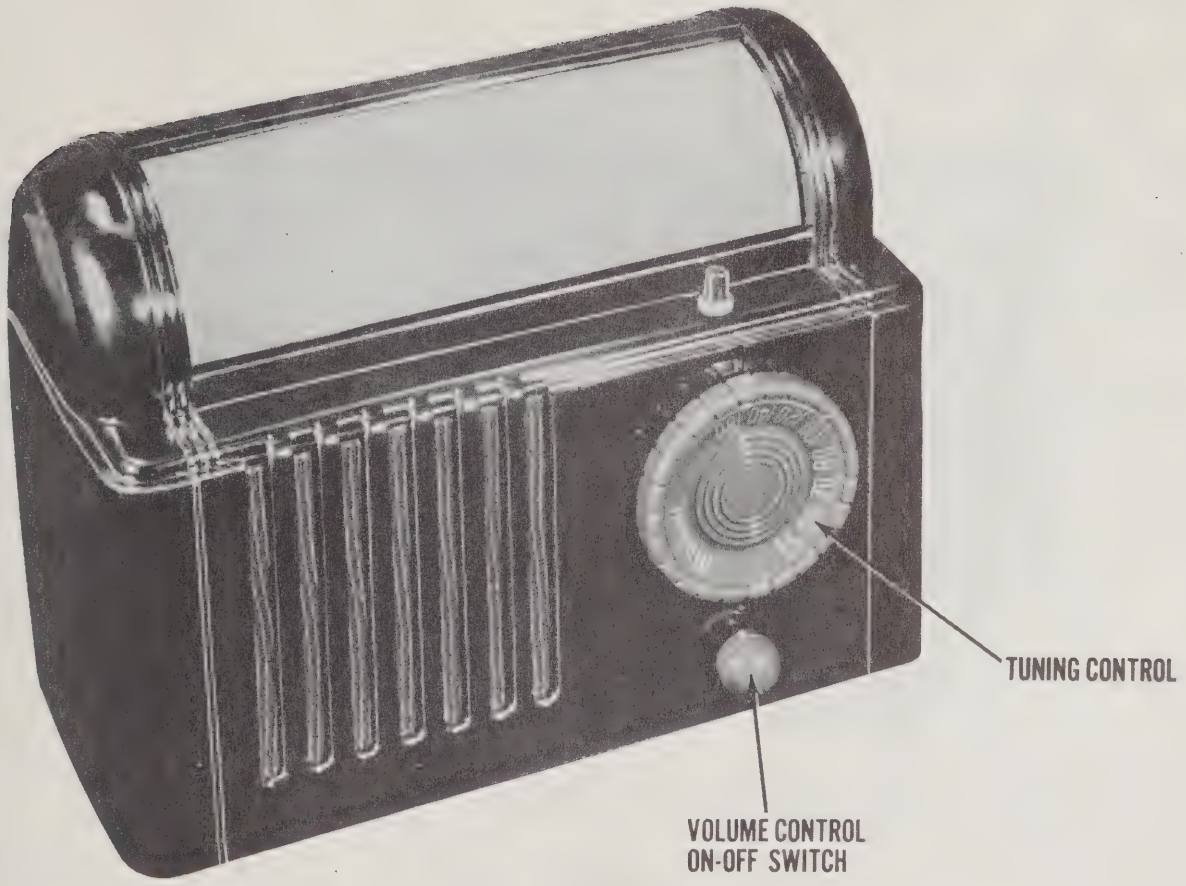


FIG. 3

MITCHELL (LULLABY) MODELS
1250, 1251



MITCHELL (LULLABY) MODELS
1250, 1251

MITCHELL MODEL 1250

TRADE NAME	Mitchell, Models (Lullaby) 1250, 1251
SUPPLIER	Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Bed Lamp.
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	535-1620KC RATING .23 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 8 (grid) of 12SA7. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A5	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 7, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MITCHELL PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MITCHELL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
6A	60	150	N-7204	PRSA150/50-30	EZ42215*	DSB-403020-150*	TA-303*	Filter-Blue
B	20	150						" -Red
7	.05	400	N-1346	484-05	GT4S5	ST-4-05	TC-15	Rectifier Bypass
8	.05	200	N-1345	484-05	GT2S5	ST-4-05	72P1	Line Isolation
9	.02	400	N-1376	484-02	GT4S2	ST-4-02	TC-12	Output Plate Bypass
10	.01	400	N-1344	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
11	.005	500	N-4894	684-005	GT6D5	ST-6-005	TC-25	" "
12	.05	200	N-1345	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
13	.05	200	N-1345	484-05	GT2S5	ST-4-05	TC-15	Tuning Cap. Iso.-Note
14	250	500	N-6135	1468-00025	5W5T25	MO.5-325	1FM-325	AF Plate Bypass-Cer.
15	100	500	N-6015	1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter "

*Parallel sections to obtain desired capacity. Note-Not used in all models.

CONTROLS

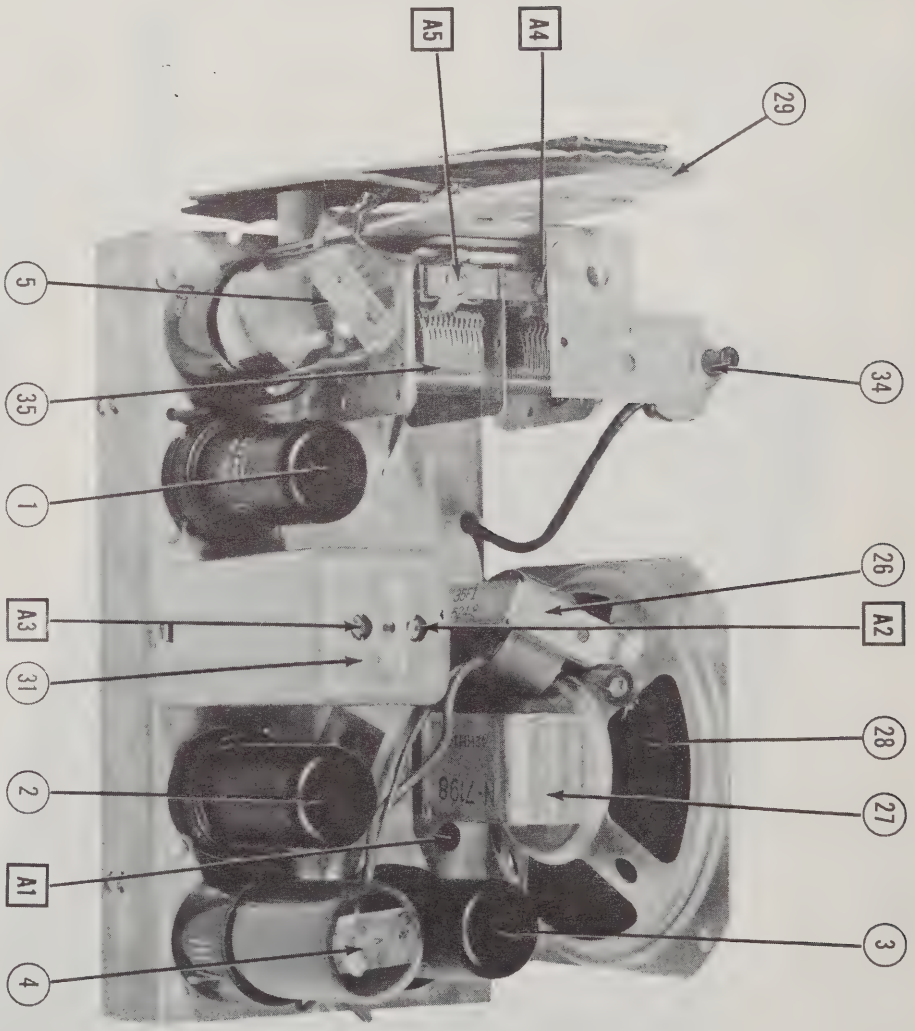
ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	MITCHELL PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	500KΩ	½	N-7205	D13-133#	AM-60-Z#	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	41	SW-A	" " " " "

#In models employing fixed stop originally, install a 47KΩ fixed resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Controls viewed from shaft side terminals down.)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MITCHELL PART No.	IRC PART No.	
17	22KΩ	½	N-4025	BTS-22K	Red-Red-Or. Osc. Grid
18	1 Meg.	½	N-1262	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
19	6.8 Meg.	½	N-4028	BTS-6.8 Meg.	Blue-Gray-Grn. AF Grid
20	220KΩ	½	N-4026	BTS-220K	Red-Red-Yl. AF Plate Load
21	470KΩ	½	N-4027	BTS-470K	Yl.-Vi.-Yl. Output Grid
22	220Ω	½	N-4024	BW-½-220	Red-Red-Br. Output Cathode
23	1200Ω	1	N-4900	BTA-1200	Br.-Red-Red Filter
24	47Ω	1	N-6258		Yl.-Vi.-Blk. Surge Limiter
25	220KΩ	½	N-4026	BTS-220K	Red-Red-Yl. Line Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MITCHELL PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
26	2500Ω	3.1Ω	290Ω	.6Ω	35F1	A-3876†	T22S45†	A-2928†	†Drill new mounting holes and mount on chassis.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MITCHELL PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-113		
27A B	PM	3.1Ω	N-7198 N-7197	Mod. P4-X	4A07	
	CONE DIA.	VC DIA.				
28	4"	9/16"				

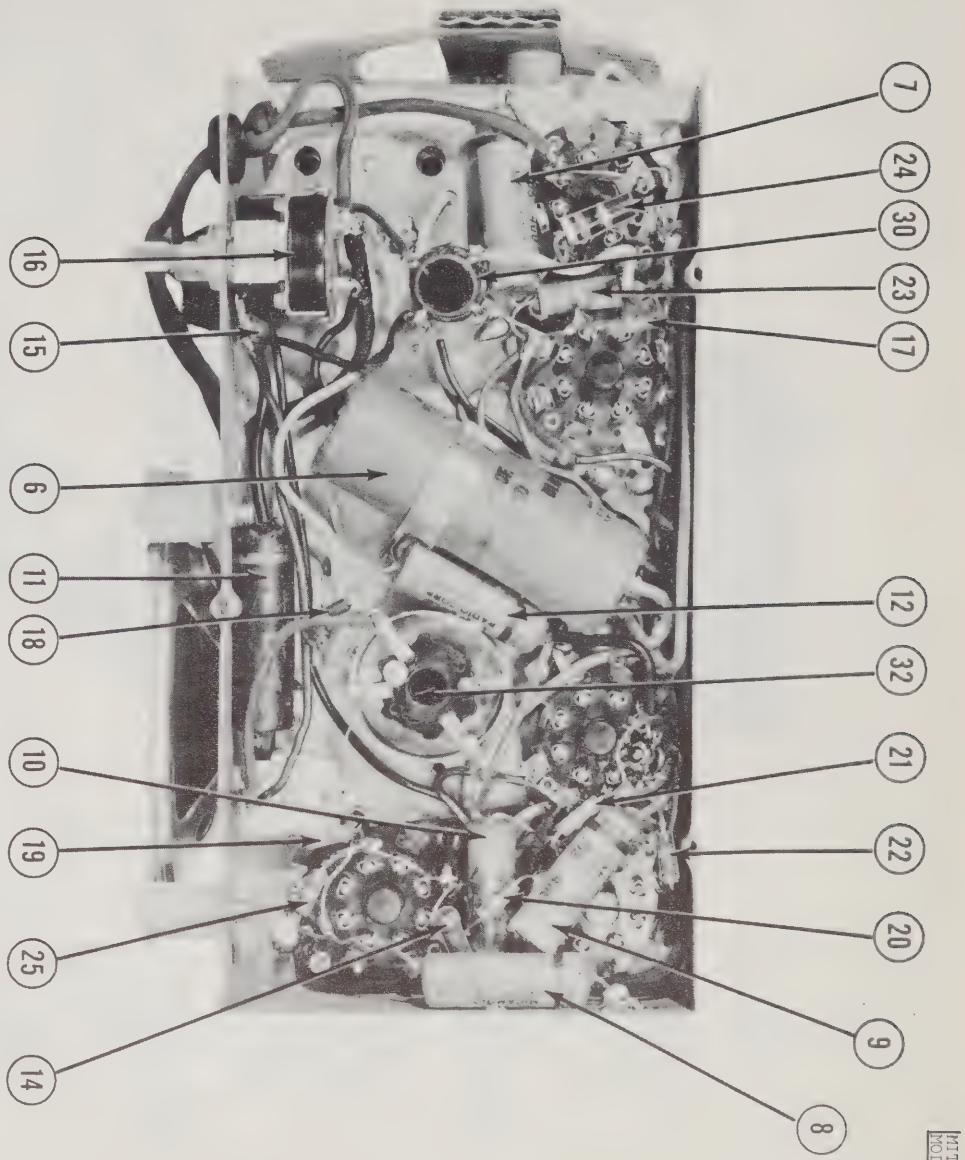
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MITCHELL PART No.	MEISSNER PART No.	
29	Loop Ant.		3Ω	N-7199		
30	Osc. Coil	.6Ω	7Ω	N-7139	14-1060‡	‡Add 50 MMFD from high side tuning cap. to osc. grid
31	Input IF	26Ω	23Ω	N-4813	16-5712	
32	Output IF	28Ω	27Ω	N-4846		

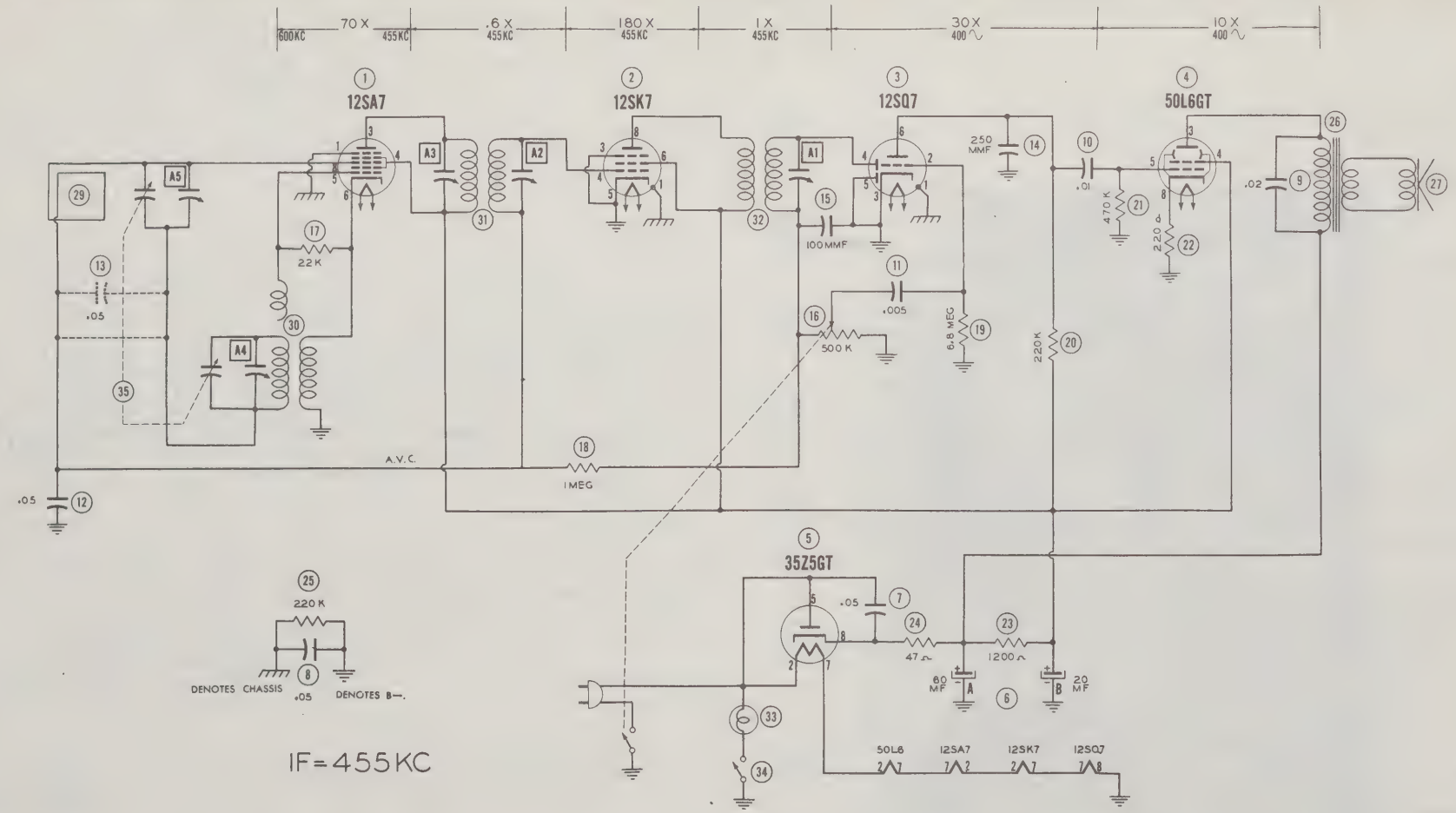
MISCELLANEOUS

ITEM No.	PART NAME	MITCHELL PART No.	NOTES
33	Bed Light	N-2595	25 watt
34	Switch	N-2094	Lamp.
35	2 Gang Var. Cap.	N-7203	(30-396MMF, 17-121MMF)

CHASSIS—BOTTOM VIEW



MITCHELL MODEL 1250



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	25VAC	97VDC	97VDC	-2.6VDC§	0V.	38VAC	-.3VDC
2	12SK7	0V.	25VAC	0V.	-.3VDC	0V.	97VDC	12VAC	97VDC
3	12SQ7	0V.	-.8VDC	0V.	-.4VDC	0V.	60VDC	12VAC	0V.
4	50L6GT	0V.	85VAC	120VDC	97VDC	0V.	125VDC	38VAC	7VDC
5	35Z5GT	0V.	117VAC	112VAC	0V.	117VAC	125VDC	85VAC	125VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	220KΩ	28Ω	100KΩ	100KΩ	22KΩ	.6Ω	40Ω	1.5 Meg.
2	12SK7	220KΩ	28Ω	0Ω	1.5 Meg.	0Ω	100KΩ	15Ω	100KΩ
3	12SQ7	220KΩ	6.8 Meg.	0Ω	500KΩ	0Ω	320KΩ	15Ω	0Ω
4	50L6GT	INF.	90Ω	100KΩ	100KΩ	470KΩ	100KΩ	40Ω	220Ω
5	35Z5GT	INF.	120Ω	115Ω	INF.	120Ω	100KΩ	50Ω	100KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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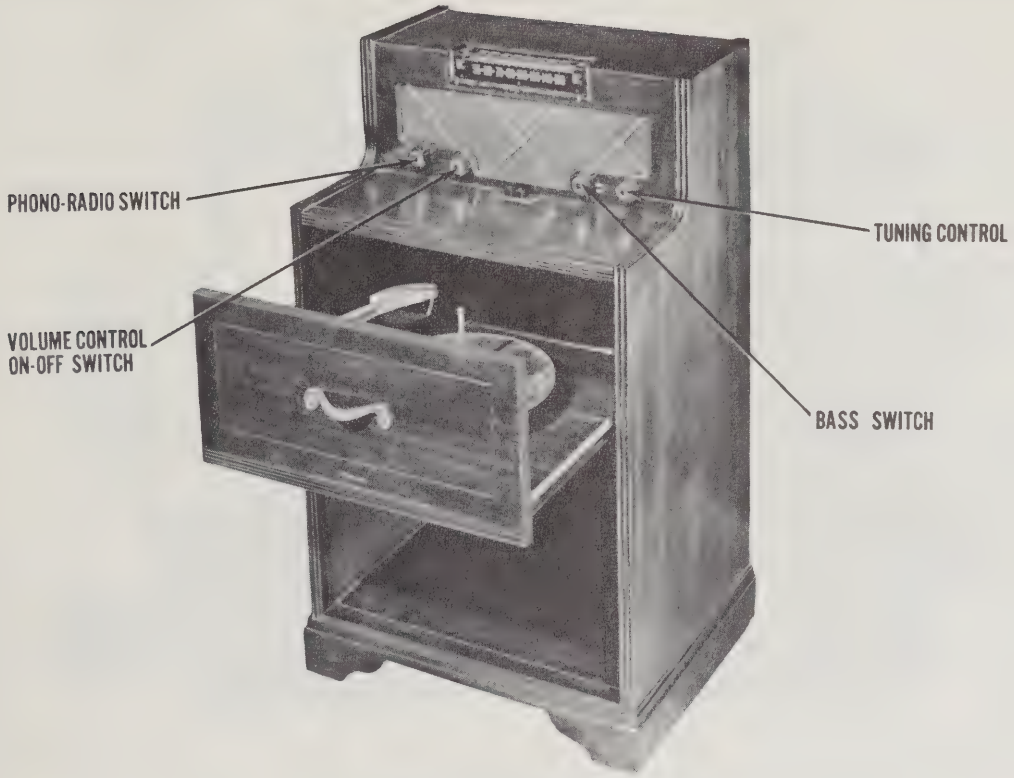
493-14

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



MOTOROLA MODEL 67F14

TRADE NAME	Motorola, Model 67F14 (Ch. HS-122)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 14C7 RF Amp., 14Q7 Converter, 14A7/12B7 IF Amp., 14B6 Det.-AVC-AF, 35A5 Power Output, 35Y4 Rectifier.
POWER SUPPLY	105-125 Volts AC
TUNING RANGE—BROADCAST	535-1620KC RATING .32 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set left edge of pointer saddle to right edge of hole at left hand end of dial backplate.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.1 MFD.	"	"	"	"	A5	Adjust for minimum output.
3	.1 MFD.	"	1620KC	"	"	A6	Adjust for maximum output. Trimmer opposite A6 is a factory adjustment and ordinarily need not be adjusted.
4		Loop	1400KC	Tune for maximum output.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

DISASSEMBLY INSTRUCTIONS

1. Disconnect phono motor plug and phono-pickup plug from underneath record changer.
2. Remove phono manual reject switch from cabinet in front of speaker grill cloth.
3. Remove four push-on type knobs from front of cabinet.
4. Remove two snap buttons from top of loop in rear of cabinet.
5. Remove three hex bolts from underneath chassis.
6. Remove chassis.

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DATE 2/49-#493-15 SET #55-FOLDER #15

MOTOROLA MODEL
67F14 (Ch. HS-122)

MOTOROLA MODEL
67F14 (Ch. HS-122)

PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 67F14

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	14C7	14C7	8V	
2	Converter	14Q7	14Q7	8AL	
3	IF Amp.	14A7/12B7	14A7/12B7	8V	
4	Det.-AVC-AF	14B6	14B6	8W	
5	Power Output	35A5	35A5	6AA	
6	Rectifier	35Y4	35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	150	23B7508		EZ42215	DSB-403020-150	TA-303	Filter-Red
B	20	150						" -Blue
C	20	150						Decoupling-Green
8	.05	400	8S9816	484-05	GT4S5	ST-4-05	TC-15	Line Filter
9	.15	200	8A72686	484-.15	GT4P2	ST-4-2	72P3	Line Isolation
10	.05	400	8S9816	484-05	GT4S5	ST-4-05	TC-15	Hash Filter
11	.02	400	8S9802	484-02	GT4S2	ST-4-02	TC-12	Output Plate Bypass
12	.01	400	8S9809	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
13	.01	400	8S9809	484-01	GT4S1	ST-4-01	TC-11	" "
14	.002	400	8S9824	484-002	GT6D2	ST-6-002	TC-22	Tone Compensation
15	1.0	100	8S9839	484-1	GT4W1	ST-2-1M	TC-10	" "
16	.1	400	8S9807	484-.1	GT4P1	ST-4-1	TC-1	Phono Isolation
17	.05	400	8S9816	484-05	GT4S5	ST-4-05	TC-15	IF Decoupling
18	.05	400	8S9816	484-05	GT4S5	ST-4-05	TC-15	AVC Filter
19	.05	400	8S9816	484-05	GT4S5	ST-4-05	TC-15	" "
20	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	AF Plate Bypass
21	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	Tone Comp.
22	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	Diode RF Filter
23	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" " "
24	100	500	21R6641	1468-0001	5W5T1	MO.5-31	1FM-31	RF Coupling

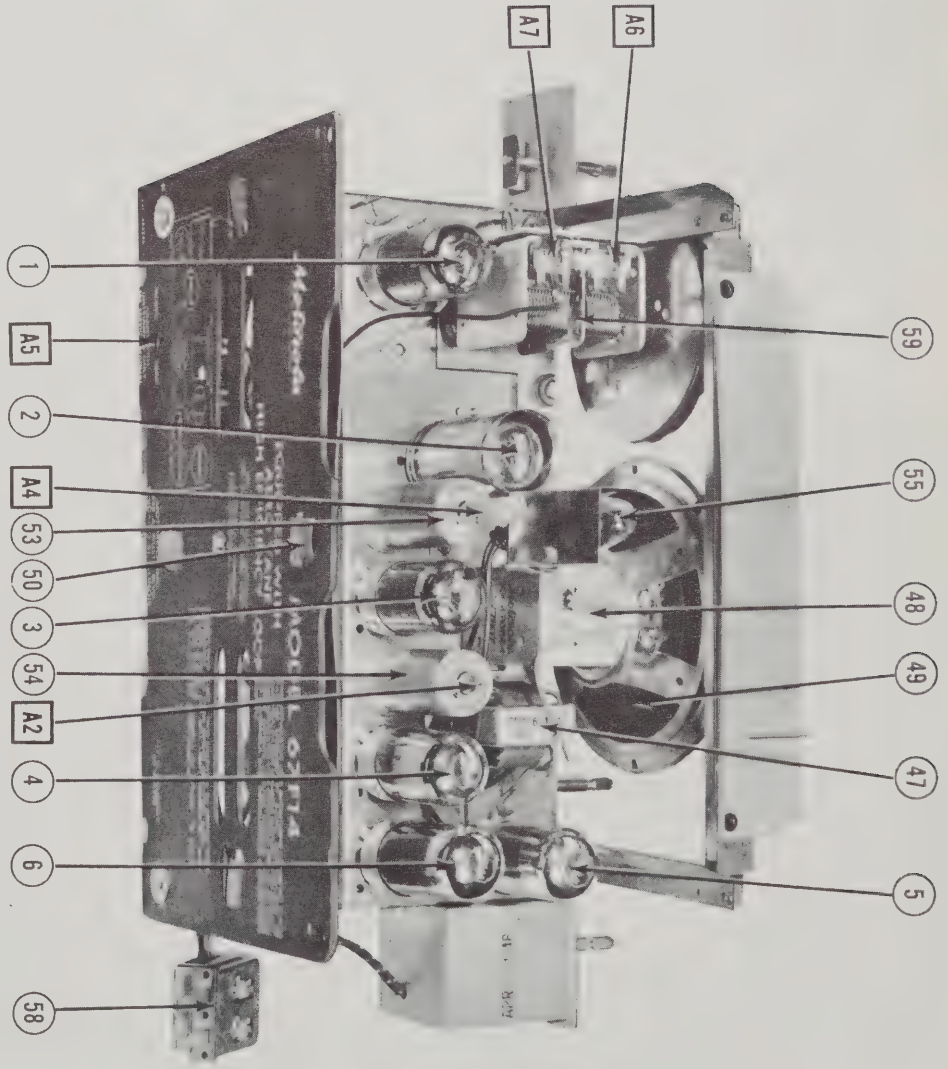
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
25A	500KΩ	½	18A76191	D17-133X	AT-81	Volume Control tapped @ 25KΩ
B	Shaft		Not Req.	E	KSS-3	Attach to 25A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
26	1 Meg.	½	6R6004	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
27	10KΩ	½	6R6054	BTS-10K	Br.-Blk.-Or. RF Plate Load
28	22KΩ	½	6R6028	BTS-22K	Red-Red-Or. Converter Grid
29	22KΩ	½	6R6028	BTS-22K	Red-Red-Or. Oscillator Grid
30	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
31	4.7 Meg.	½	6R2122	BTS-4.7 Meg.	Yl.-Vi.-Grn. " "
32	220Ω	½	6R3933	BW-½-220	Red-Red-Br. IF Decoupling
33	1 Meg.	½	6R6004	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
34	47KΩ	½	6R6056	BTS-47K	Yl.-Vi.-Or. Diode RF Filter
35	470KΩ	½	6R6032	BTS-470K	Yl.-Vi.-Yl. Series Phono
36	100Ω	½	6R6326	BW-½-100	Br.-Blk.-Br. Tone Compensation
37	1200Ω	½	6R6393	BTS-1200	Br.-Red-Red " "
38	1200Ω	½	6R6393	BTS-1200	Br.-Red-Red " "
39	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	Or.-Or.-Grn. AF Grid
40	220KΩ	½	6R6015	BTS-220K	Red-Red-Yl. AF Plate Load
41	470KΩ	½	6R6032	BTS-470K	Yl.-Vi.-Yl. Output Grid
42	150Ω	½	6R6373	BW-½-150	Br.-Grn.-Br. Output Cathode
43	1200Ω	1	6R5770	BTA-1200	Br.-Red-Red Filter
44	220Ω	1	6R6389	BW-1-220	Red-Red-Br. "
45	27Ω	½	6R5683		Red-Vi.-Blk. Surge Limiter
46	22KΩ	½	6R6028	BTS-22K	Red-Red-Or. Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
47	2300Ω	3.3Ω	260Ω	.8Ω	25B76117	A-3876#	T22S45#	A-2928#	#Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
48	FIELD PM	VC IMP. 3.3Ω	50C470684	ST-107† Mod. P5-V	5A15†	†Fabricate new mounting bracket.
49	CONE DIA. 4-3/4"	VC DIA. 9/16"				

R F COILS

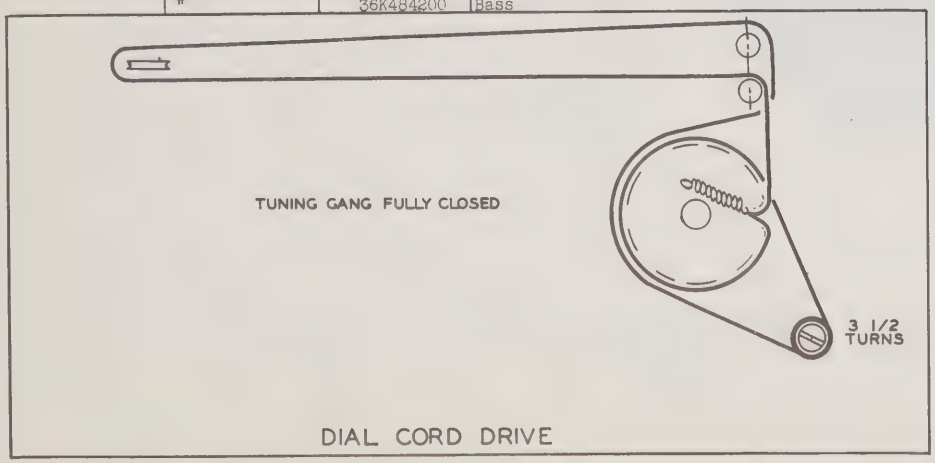
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
50	Loop Ant.		2Ω	24K77323		
51	Wave Trap		60Ω	24A77336		
52	Osc. Coil	1.2Ω	8Ω	24A76192	14-1060*	*Add 50 MMFD cap. from high side of tuning cap. to osc. grid.
53	Input IF	14Ω	14Ω	24B470038		
54	Output IF	13Ω	13Ω	24B75487		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MOTOROLA PART No.		
55	Screw	117			65A470930		Type C7

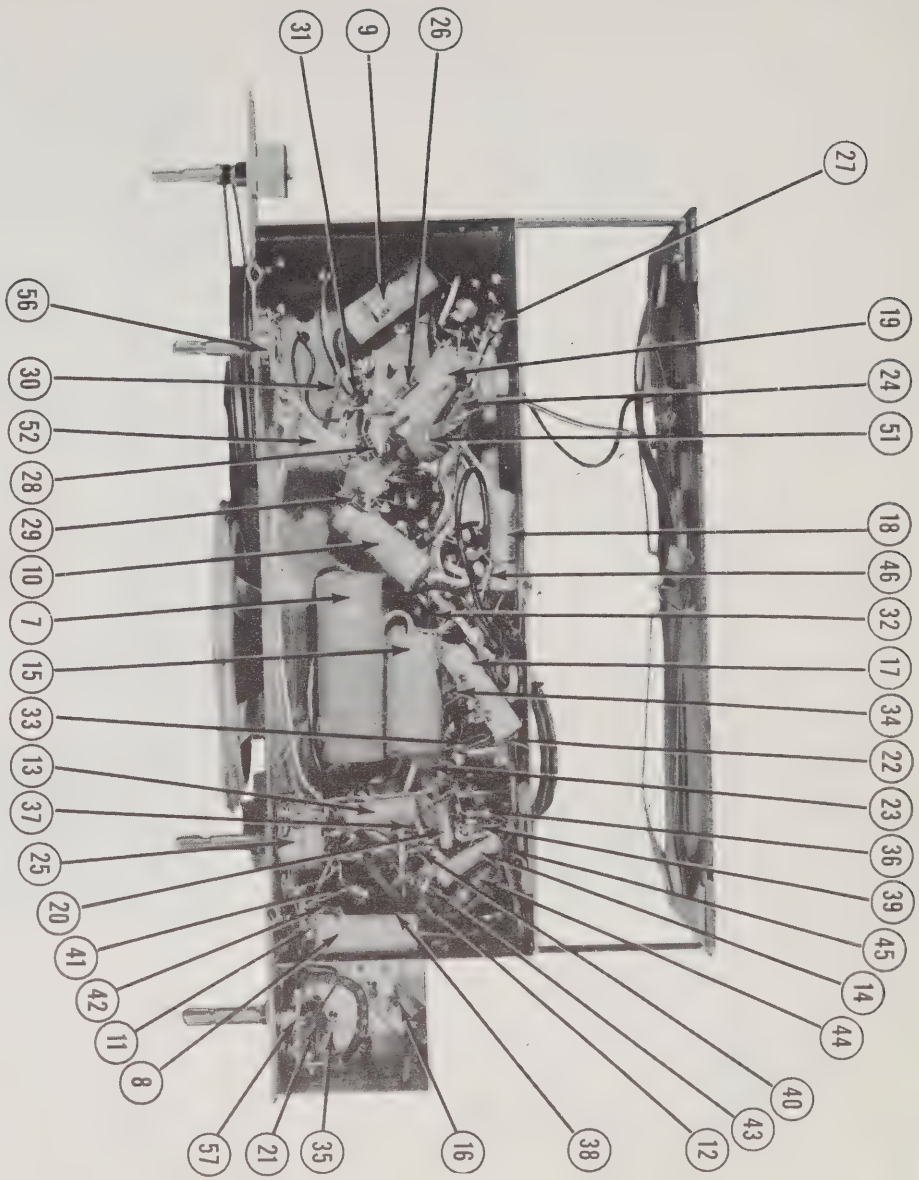
MISCELLANEOUS

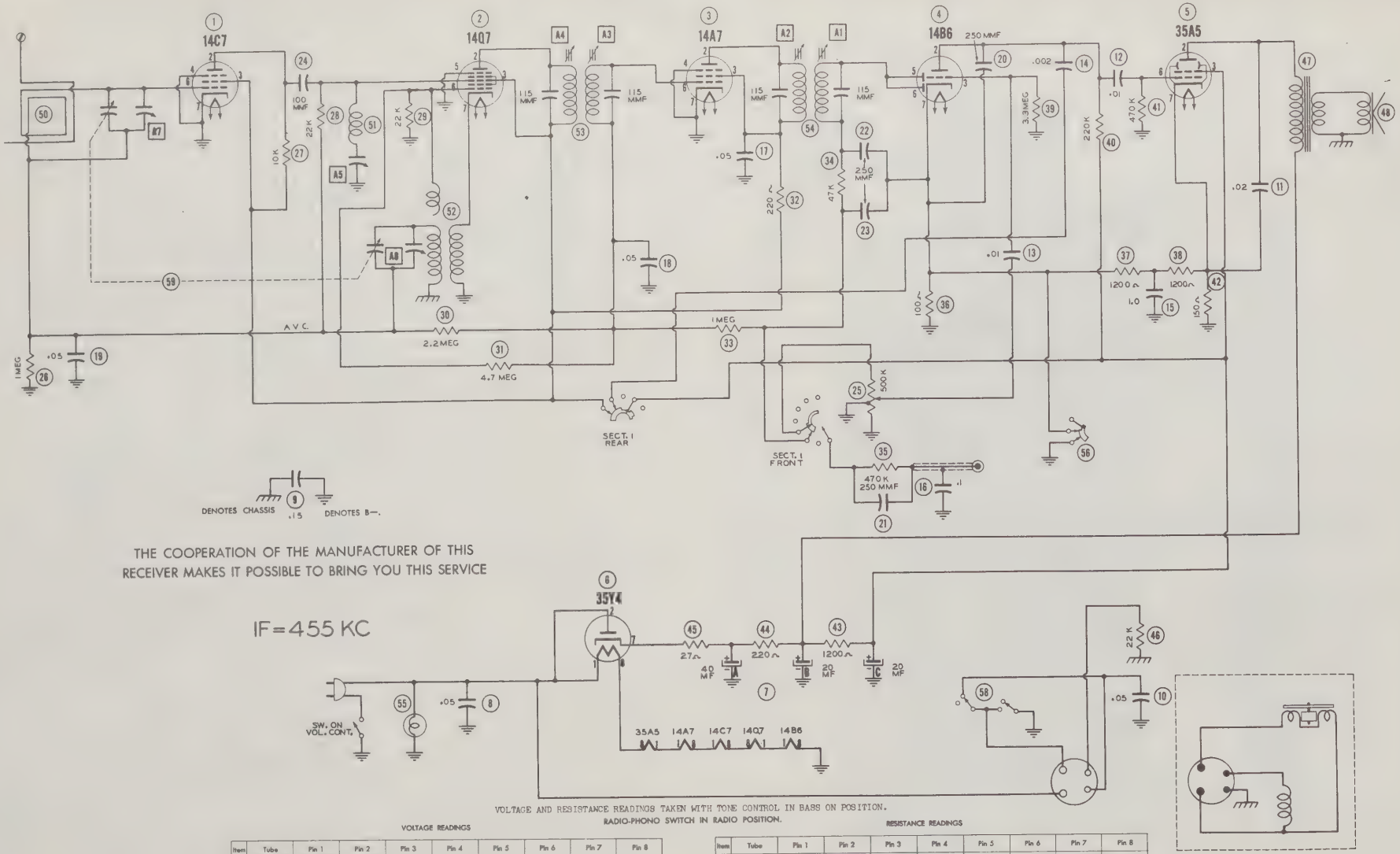
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
56	Switch	40A30444	Bass
57	"	40K470676	Radio-Phono
58	"	40K471447	Motor-Reject
59	2 Gang Var. Cap.	1X77339	(32-460MMF, 37-199MMF)
A5	Trimmer	20A26941	Wave Trap Adj.
	Dial Scale	1X484215	
	Dial Pointer	52A77307	
	Cabinet	16K484213	
	Knob	36K478403	Tone-Phono/Radio
	"	36K478402	Volume-Tuning
	"	36K484200	Bass



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





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IF=455 KC

VOLTAGE AND RESISTANCE READINGS TAKEN WITH TONE CONTROL IN BASS ON POSITION.
RADIO-PHONO SWITCH IN RADIO POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14C7	40VAC	35VDC	85VDC	0V.	0V.	-.5VDC	0V.	27VAC
2	14Q7	13VAC	85VDC	85VDC	-7.6VDC$	0V.	-.5VDC	0V.	27VAC
3	14A7	50VAC	80VDC	80VDC	0V.	0V.	-.5VDC	0V.	40VAC
4	14B6	13VAC	55VDC	-.4VDC	.2VDC	-.6VDC	-.6VDC	.2VDC	0V.
5	35A5	50VAC	110VDC	85VDC	85VDC	2.6VDC	0V.	5VDC	77VAC
6	35Y4	117VAC	117VAC	115VDC	110VAC	0V.	128VDC	130VDC	77VAC

$TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14C7	34Ω	90KΩ	80KΩ	0Ω	0Ω	700KΩ	0Ω	23Ω
2	14Q7	12Ω	80KΩ	80KΩ	22KΩ	0Ω	720KΩ	1.2Ω	23Ω
3	14A7	44Ω	80KΩ	60KΩ	0Ω	0Ω	900KΩ	0Ω	34Ω
4	14B6	12Ω	300KΩ	3.3 Meg.	100Ω	560KΩ	560KΩ	100Ω	0Ω
5	35A5	44Ω	80KΩ	80KΩ	80KΩ	650Ω	470KΩ	150Ω	60Ω
6	35Y4	75Ω	75Ω	80KΩ	70Ω	0Ω	80KΩ	80KΩ	60Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

MOTOROLA
MODEL VT71

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MOTOROLA
MODEL VT71

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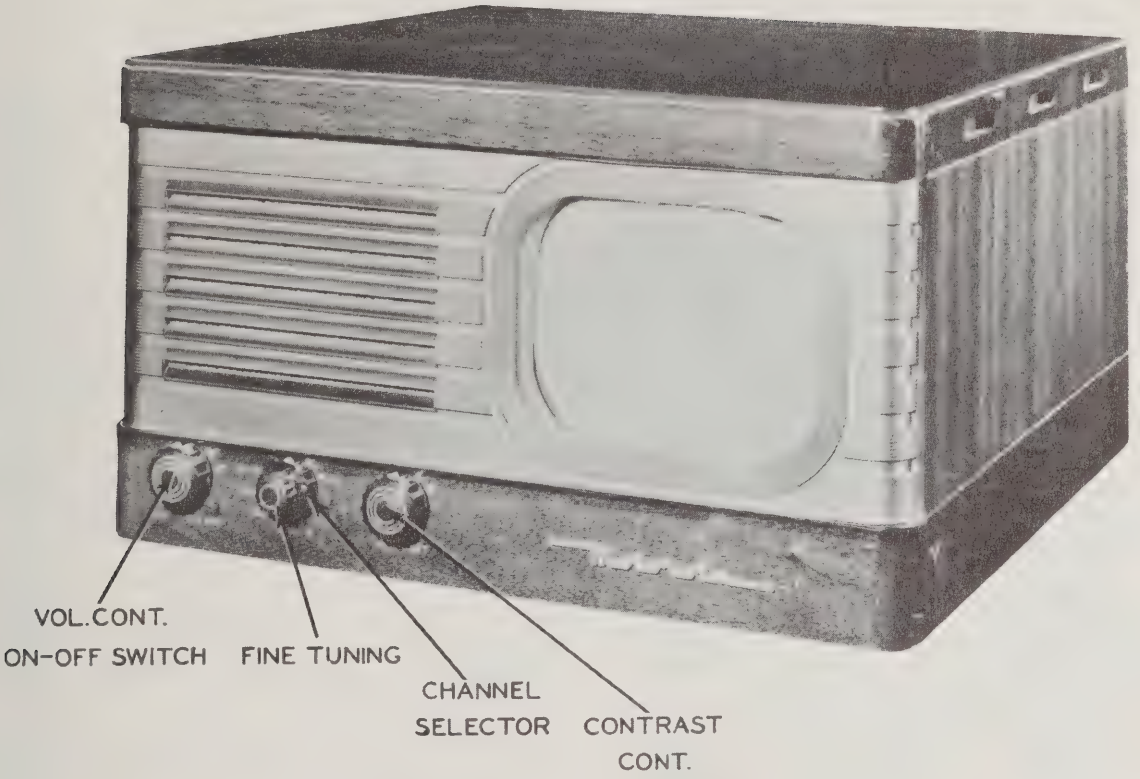

MOTOROLA
MODEL VT71

MOTOROLA MODEL VT71

TRADE NAME	Motorola, Model VT71
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	115 Volts, 60 Cycle AC RATING 115 Volts @ .96 Amps.
TUNING RANGE–	Channels 2 through 13

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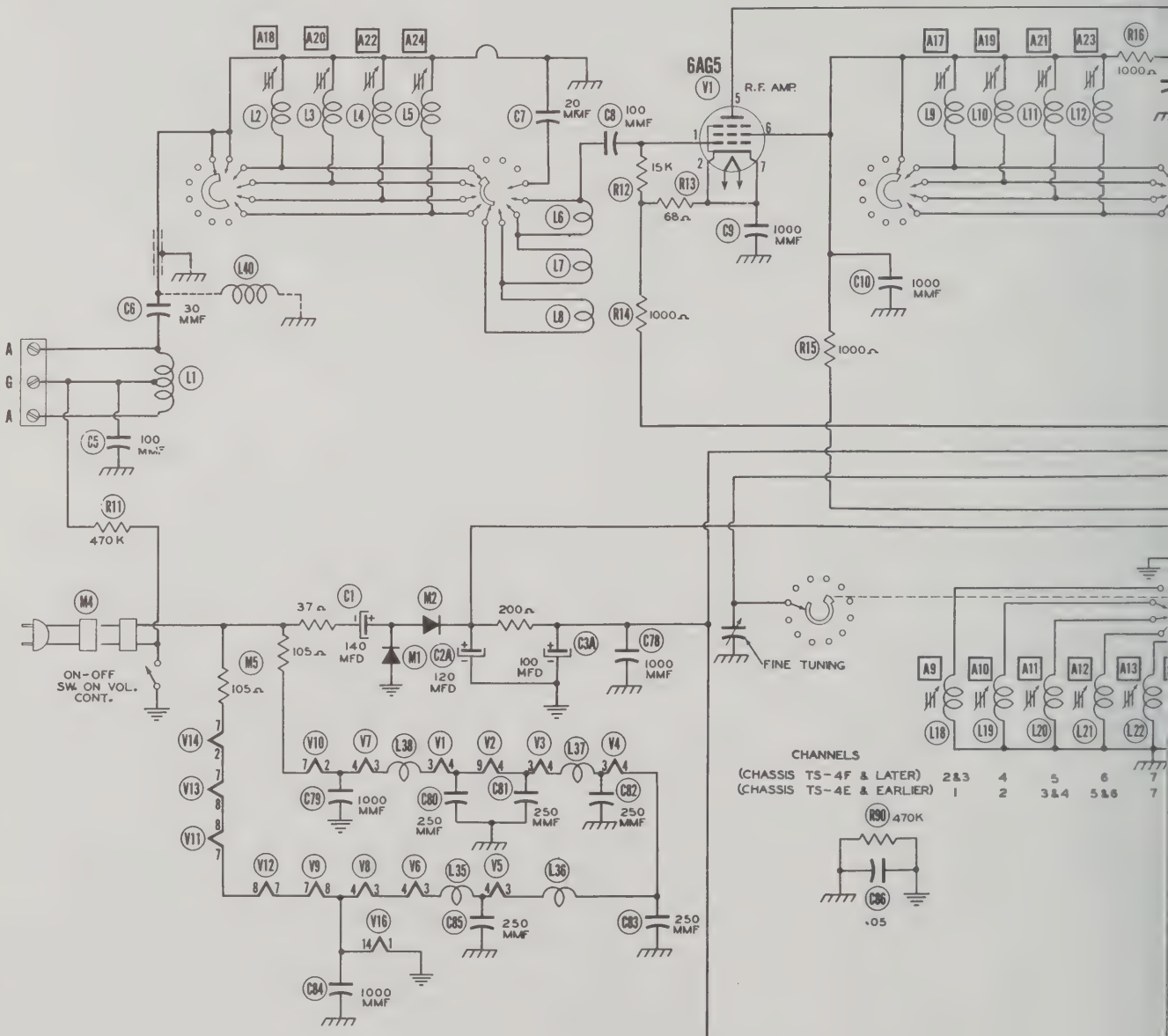
DATE 2/49-#493-16 SET #55-FOLDER #16



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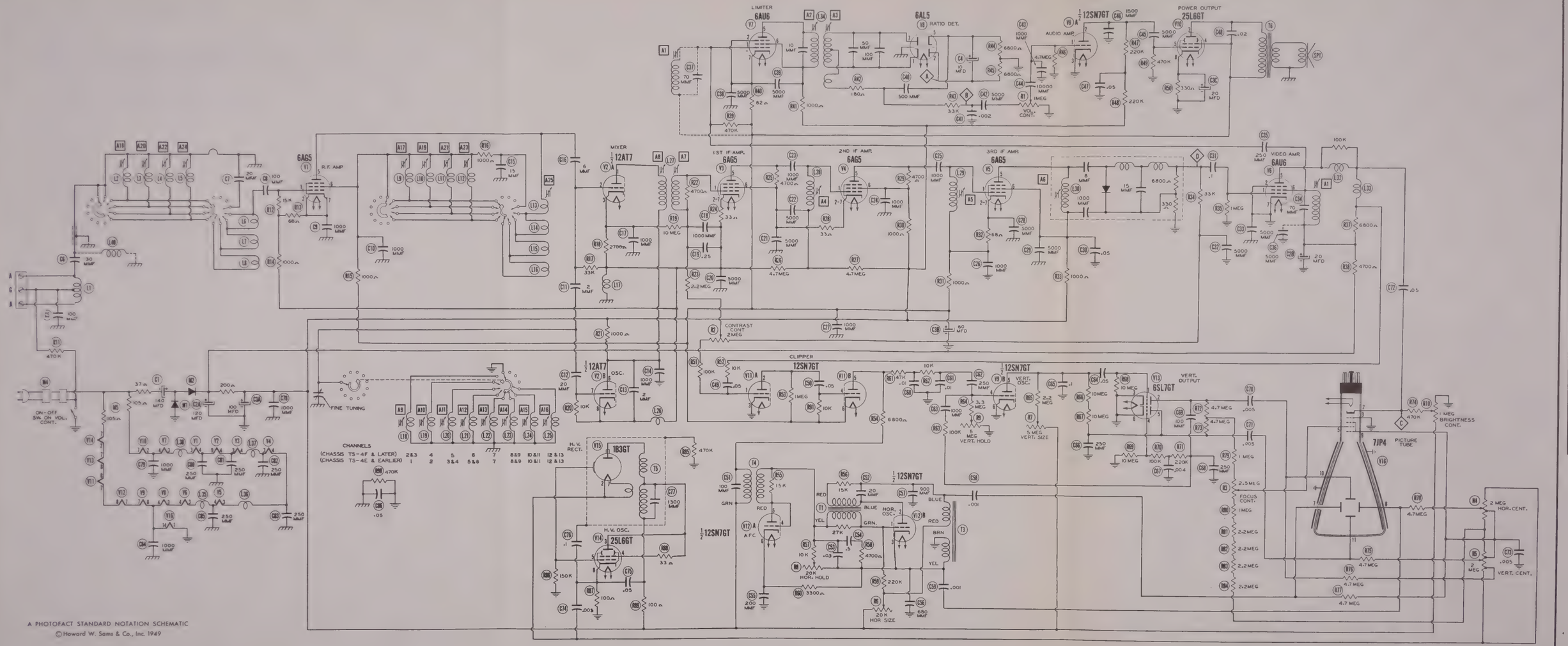
MOTOROLA
MODEL VT71
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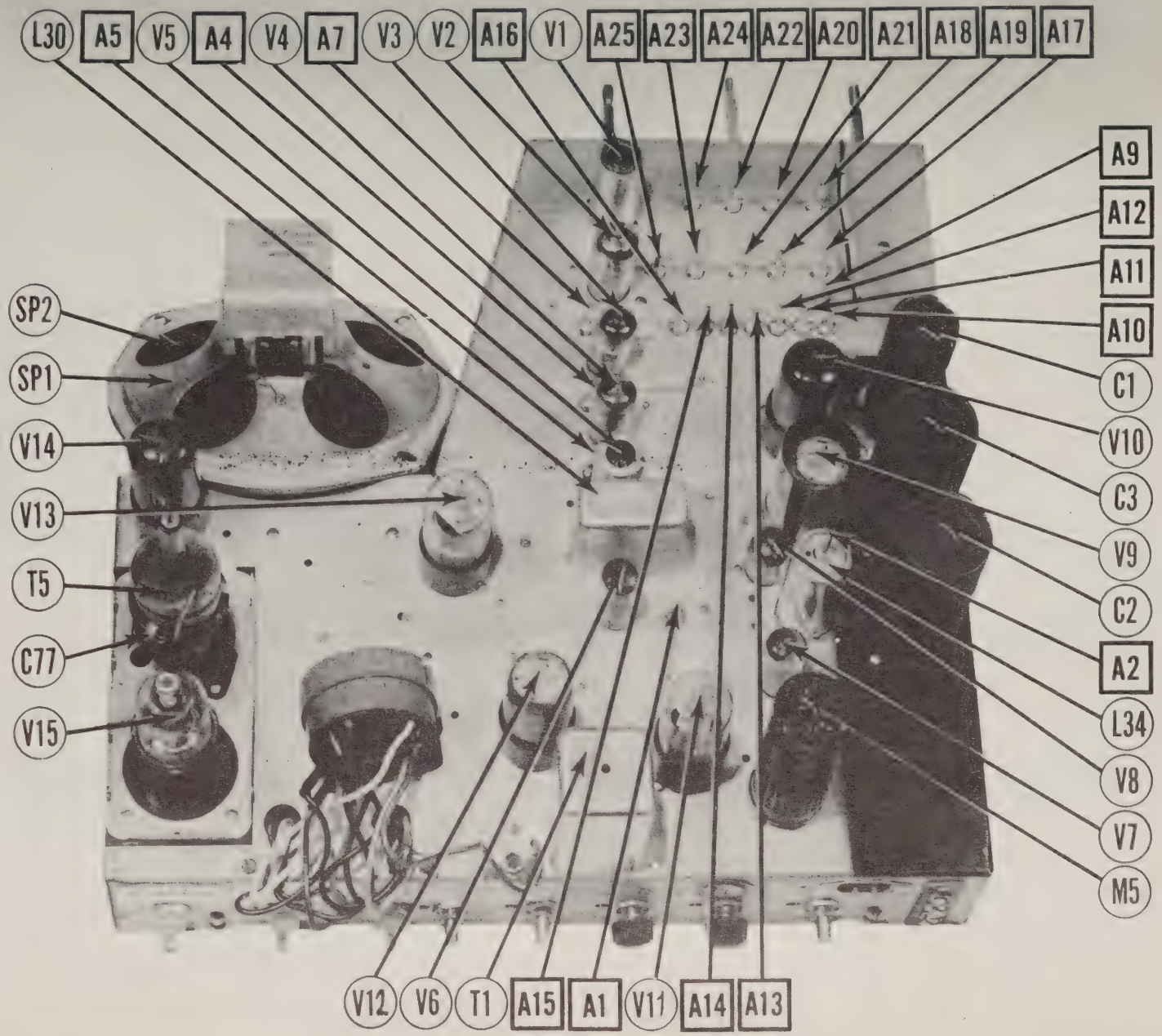
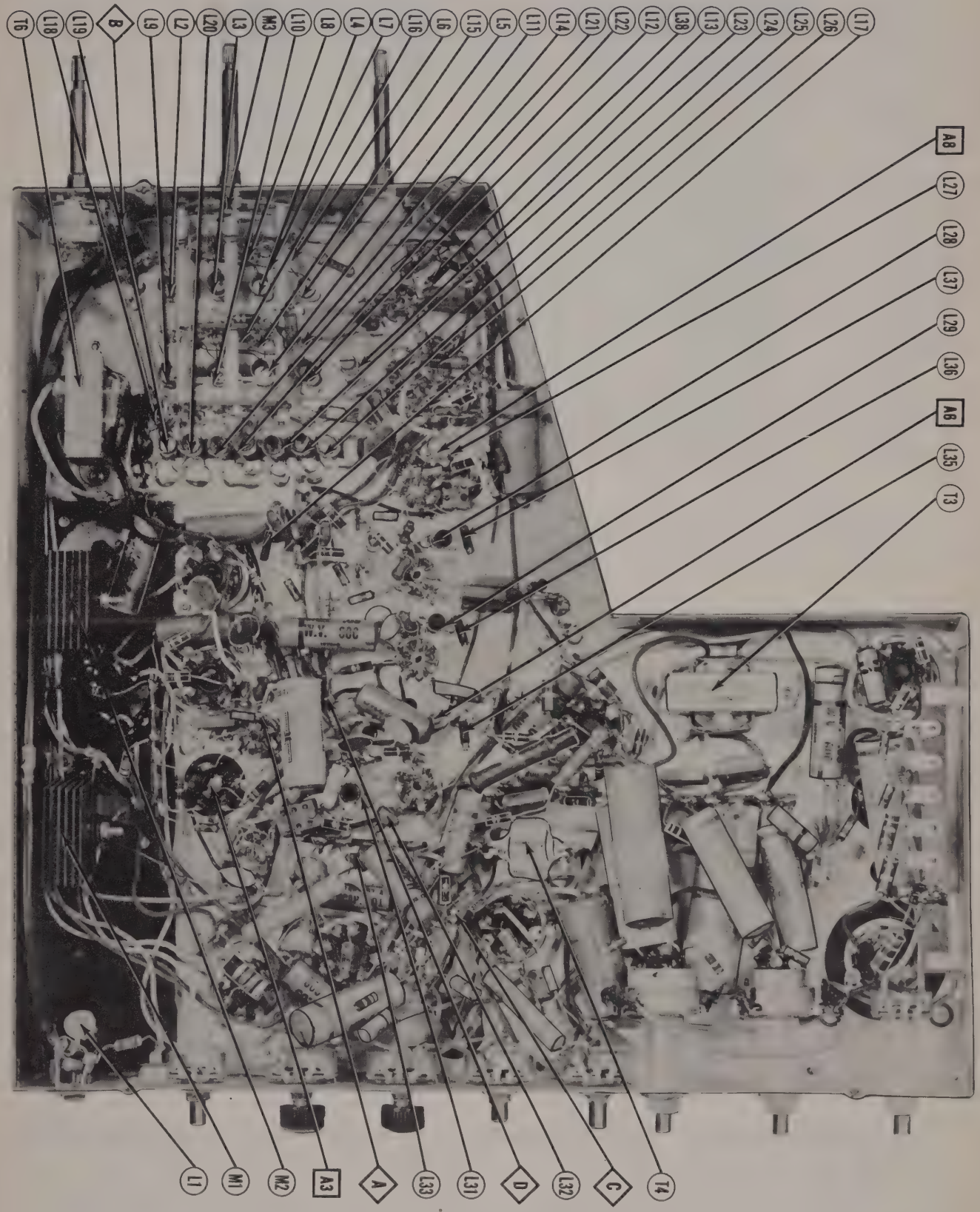


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2A	Converter	12AT7	12AT7	9A	
B	Converter	7F8	7F8	8BW	Used in some models.
V3	1st IF Amp.	6AG5	6AG5	7BD	
V4	2nd IF Amp.	6AG5	6AG5	7BD	
V5	3rd IF Amp.	6AG5	6AG5	7BD	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	Limiter	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	Audio Amp.-Vert. Osc.	12SN7GT	12SN7GT	8BD	Chassis TS-4B, C, D use 6SQ7 for AF Amp.
V10	Power Output	25L6GT	25L6GT	7AC	
V11	Clipper	12SN7GT	12SN7GT	8BD	
V12	AFC, Hor. Osc.	12SN7GT	12SN7GT	8BD	
V13	Vert. Output	6SL7GT	6SL7GT	8BD	
V14	H. V. Osc.	25L6GT	25L6GT	7AC	
V15	H. V. Rect.	1B3GT	1B3GT		
V16	Picture Tube	7JP4	7JP4	14G	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	18A90142	D13-137	AM-64-Z	Volume
B	Shaft			E	KSS-3	Attach to R1A per instructions
C	Switch			41	SW-A	" " " "
R2A	2 Meg.	½	18A90174		AM-63-S	Contrast-See Note 1
B	Shaft				KSS-3	Attach to R2A per instructions-See Note 1
R3	2.5 Meg.	½	18A90148			Focus
R4	2 Meg.	½	18A484192			Horiz. Centering-Tapped @ 400KΩ & 1 Meg.-See Note 2
R5	2 Meg.	½	18A478285		M-83-S	Vertical Centering
R6	20KΩ	½	18A90144			Horizontal Size
R7A	5 Meg.	½	18A90145	D11-141		Vertical Size
B	Shaft			P		Attach to R7A per instructions
R8	20KΩ	½	18A90144			Horizontal Hold
R9A	5 Meg.	½	18AD0145	D11-141		Vertical Hold-See Note 3
B	Shaft			P		Attach to R9A per instructions
R10A	1 Meg.	½	18A90147	D11-137	M-61-S	Brightness
B	Shaft			P	Not Req.	Attach to R10A per instructions

Note 1-This control is 2000Ω in chassis TS-4J.
Note 2-This control in chassis Models TS-4B & C has a 1 Meg. tap only.
Note 3-This control in chassis Models TS-4B & C is a 1 Meg. control.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	140	150	23B90135	AF888D*			TVL-44	Doubling Cap.-Note 1
C2A	120	300	23B90134	AF4444J*			TVL-46	◓ Filter
B	20	300		PRS450/40				▲ "
C3A	100	300	23B90136				TVL-51	◓ "
B	60	150						■ "
C	20	25						▲ Output Cathode Bypass
C4	10	50	23A90205	PRS50-10	BR105	M-10-50	TA-510	Stabilizing Cap.
C5	100		21R6631					Ext. Ground Isolation
C6	30		21K470329					Antenna Coupling- Cer.
C7	20		21K470322					Fixed Trimmer "
C8	100		21B77286					RF Coupling "
C9	1000		21K478410					RF Cath. Bypass " See Note 2
C10	1000		21K478410					RF Screen Bypass " See Note 2
C11	2		21K478280					Osc. Coupling "
C12	20		21K478287					Osc. Grid Cap. "
C13	2		21K478280					Osc. Feedback "
C14	1000		21K478410					RF Bypass-See Note 3 "
C15	15		21K470323					RF Decoupling "
C16	6		21K470324					RF Coupling "
C17	1000		21K478410					Conv. Cath. Bypass " See Note 3
C18	1000		21K478410					Bias Filter-Note 3 "
C19	.25	200	8A471356					" "
C20	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	1st IF Cath. Byp. "
C21	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	1st IF Screen Byp. "
C22	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Bias Filter "
C23	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	IF Coupling "
C24	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	2nd IF Screen Byp. " See Note 3
C25	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	IF Coupling "
C26	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	RF Filter-Note 3 "
C27	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	" " -Note 4 "
C28	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	3rd IF Cath. Byp. " See Note 5
C29	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	3rd IF Screen Byp. " See Note 5
C30	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	3rd IF Screen Byp. See Note 6
C31	.1	100	8A471366	484-.1	DT4P1	ST-2-1	TM-1	Video Coupling See Note 7
C32	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	RF Bypass-Note 8 "
C33	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	" " "
C34	70		21K470328					Fixed Trimmer-Note 9 "
C35	250	250	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	Sound Coupling-Note 10
C36	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Video Amp. Screen " Note 11
C37	70		21K470328					Fixed Trimmer-Note 12 "
C38	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Limiter Cath. Byp. "
C39	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Limiter Decoup. "
C40	500	500	21R6590	1468-0005	5W5T5	MO.5-35	1FM-35	Diode Load-Note 13
C41	.02	600	8A471157	684-002	DT6D2	ST-6-002	TM-22	De-emphasis-Note 14
C42	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Audio Coupling " Note 15
C43	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	Tone Comp.-Note 6 "
C44	10000		21K482726	1467-01	1D3S1	MW.3-11	1FM-11	Audio Coupling " Note 16
C45	5000		21A470789	1467-005	1D5D5	MW.5-25	1FM-25	Audio Coupling "
C46	1500		21A470790	1467-0015	1W5D15	MW.5-215	1FM-215	Audio Plate Bypass " Note 17
C47	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	Audio Plate Decoup.
C48	.02	600	8A471152	684-02	DT6S2	ST-6-02	TM-12	Output Plate Bypass
C49	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	Sync. Coupling
C50	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	" "
C51	100		21R6631	1468-0001	5W5T1	MO.5-31	1FM-31	Fixed Trimmer-Note 6 "
C52	40		21K470322					Feedback-Note 18 "
C53	.03	600	8A482184	684-03	DT6S3	ST-6-03	TM-13	Hor. Osc. Grid
C54	.5	250	8A484814	484-.5	DT4P5	ST-2-5	TC-5	" " "
C55	250	500	21R6629	1468-002	5W5T2	MO.5-32	1FM-32	AFC Coupling
C56	650	500	21R2741					Fixed Trimmer " " "
C57	300	100	21R2739					" " "
C58	.001	6000	8A480255		DSTH60D1	STM-60-001	TVM-216	Hor. Coupling-Note 19
C59	.001	6000	8A480255		DSTH60D1	STM-60-001	TVM-216	" " " "
C60	.01	600	8A471153	684-01	DT6S1	ST-6-01	TM-11	Integrating Network
C61	.01	600	8A471153	684-01	DT6S1	ST-6-01	TM-11	" "
C62	350	350	21R6645	1468-00025	5W5T25	MO.5-325	1FM-325	Vert. Sync. Coupling
C63	1200	50	21R6630	1468-001	1W5D1	MW.5-21	1FM-21	Feedback
C64	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	" "
C65	.1	200	8A471149	684-.1	DT6P1	ST-6-1	TM-1	Vert. Discharge
C66	250		21A481402	1468-00025	5W5T25	MO.5-325	1FM-325	Linearity Comp. "
C67	.004	600	8A471156	684-004	DT6D4	ST-6-004	TM-24	" " "
C68	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	Voltage Divider "
C69	100		21A471211	1468-0001	5W5T1	MO.5-31	1FM-31	" " "
C70	.005	600	8K48866		DSTH60D5	STM-60-005	TVM-256	Vert. Coupling
C71	.005	600	8K48866		DSTH60D5	STM-60-005	TVM-256	" "
C72	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	Video Coupling
C73	.005	6000	8A471348		DSTH60D5	STM-60-005	TVM-256	H.V. Filter-Note 4
C74	.005	6000	8A471348		DSTH60D5	STM-60-005	TVM-256	" " "
C75	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	RF Bypass-Note 20 " "
C76	.1	200	8A471355	484-.1	DT4P1	ST-2-1	TM-1	" "
C77	1800	500	21R2738					Fixed Trimmer-5%
C78	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	RF Bypass-Note 3 "
C79	1000	500	21R6638	1468-001	1W5D1	MW.5-21	1FM-21	Fil. Bypass " "
C80	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" "
C81	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" "
C82	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" "
C83	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" "
C84	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	" " "
C85	250	500	21R6648	1468-00025	5W5T25	MO.5-325	1FM-325	" "
C86	.05	600	8A471151	684-05	DT6S5	ST-6-05	TM-15	Line Isolation
C87	15		21K470323					Fixed Trimmer
C88	20		21K470322					Osc. Grid
C89	500	500	21R6579	1468-0005	5W5T5	MO.5-35	1FM-35	Fixed Trimmer " "
C90	500	500	21R6579	1468-0005	5W5T5	MO.5-35	1FM-35	" "
C91	.01	600	8A471153	684-01	DT6S1	ST-6-01	TM-11	Vert. Sync. Coupling
C92	1000		21K478410	1468-001	1W5D1	MW.5-21	1FM-21	Fixed Trimmer
C93	.01	600	8A471153	684-01	DT6S1	ST-6-01	TM-11	Vert. Osc. Grid
C94	6		21K470324					Fixed Trimmer-Note 15

*Parallel sections to obtain desired capacity.
Note 1-Chassis TS-4B, C, D, E use 150 MFD @ 250 V.
Note 2-Chassis TS-4B, C use 1500 MMFD.
Note 3-Chassis TS-4B use 1500 MMFD.
Note 4-Not used in Chassis TS-4B, C.
Note 5-Chassis TS-4B use 1500 MMFD, TS-4D use 1000 MMFD.
Note 6-Not used on Chassis TS-4B, C, D.
Note 7-Not used on Chassis TS-4B, C, D, E.
Note 8-Not used on Chassis TS-4B, C, D, J.
Note 9-Not used on Chassis TS-4B, C, D, E, J.
Note 10-Chassis TS-4B uses 2 MMFD, TS-4C, D, E, J use 2.2 MMFD.
Note 11-Not used on Chassis TS-4E, F, G, H. J.
Note 12-Not used on Chassis TS-4F, G, H.
Note 13-Chassis TS-4B uses 300 MMF.
Note 14-Chassis TS-4D uses 1000 MMF., TS-4E, F, H, G, J none.
Note 15-Used on Chassis TS-4B, C only.
Note 16-Chassis TS-4B uses 1500 MMFD, TS-4C uses 1000 MMFD, TS-4D uses 5000 MMFD.
Note 17-Chassis TS-4C uses 1000 MMFD, TS-4E, F, G, H. J use none.
Note 18-Chassis TS-4E, F use 50 MMFD.
Note 19-Chassis TS-4B, C use .0005 @ 6000 V.
Note 20-Chassis TS-4E, F use 10 MFD @ 350 V.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES (ALL RESISTORS ± 10% TOLERANCE UNLESS OTHERWISE STATED)
R11	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. External Ground Isolation
R12	15KΩ	½	6R6477	BTS-15K	Br.-Grn.-Or. RF Amp. Grid
R13	68Ω	½	6R2039		Blue-Gray-Blk. RF Amp. Cathode
R14	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red Voltage Dropping-See Note 1
R15	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red " "
R16	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red RF Amp. Plate Decoupling
R17	33KΩ	½	6R6410	BTS-33K	Or.-Or.-Or. Conv. Grid
R18	2700Ω	½	6R5577	BTS-2700	Red-V1.-Red Conv. Cathode
R19	10 Meg.	½	6R5622	BTS-10 Meg.	Br.-Blk.-Blue Feedback-See Note 1
R20	10KΩ	½	6R6320	BTS-10K	br.-Blk.-Or. Osc. Grid
R21	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red Osc. Plate
R22	4700Ω	½	6R6080	BTS-4700	Y1.-V1.-Red 1st IF Amp. Grid Coil Shunt
R23	2.2 Meg.	½	6R6433	BTS-2.2 Meg.	Red-Red-Grn. Bias Network-See Note 1
R24	33Ω	½	6R2036		Or.-Or.-Blk. 1st IF Amp. Cathode-See Note 2
R25	4700Ω	½	6R6080	BTS-4700	Y1.-V1.-Red 1st IF Amp. Plate
R26	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Y1.-V1.-Grn. Bias Network
R27	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Y1.-V1.-Grn. " "
R28	33Ω	½	6R2036		Or.-Or.-Blk. 2nd IF Amp. Cathode-See Note 2
R29	4700Ω	½	6R6080	BTS-4700	Y1.-V1.-Red 2nd IF Amp. Plate
R30	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red Decoupling
R31	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red Voltage Dropping
R32	68Ω	½	6R2039		Blue-Gray-Blk. 3rd IF Amp. Cathode
R33	1000Ω	½	6R6229	BTS-1000	Br.-Blk.-Red Voltage Dropping
R34	33KΩ	½	6R6410	BTS-33K	Or.-Or.-Or. Bias Network-See Note 3
R35	1 Meg.	½	6R6046	BTS-1 Meg.	Br.-Blk.-Grn. Video Amp. Grid-See Note 4
R36	33Ω	½	6R2036		Or.-Or.-Blk. Video Amp. Cathode-See Note 5
R37	68000Ω	2	6R5690	BT-2-6800	Blue-Gray-Red Voltage Dropping-See Note 6
R38	4700Ω	2	6R5671	BT-2-4700	Y1.-V1.-Red " " "
R39	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Limiter Grid-See Note 7
R40	82Ω	½	6R2035		Gray-Red-Blk. Limiter Cathode
R41	1000Ω	½	6R6229	BTS-8200	Br.-Blk.-Red Limiter Decoupling
R42	180Ω	½	6R5660		Br.-Gray-Br. Balancing-See Note 8
R43	33KΩ	½	6R6410	BTS-33K	Or.-Or.-Or. De-emphasis
R44	6800Ω	½	6R6428	BTS-6800	Blue-Gray-Red Diode Load-See Note 9
R45	6800Ω	½	6R6428	BTS-6800	Blue-Gray-Red " " "
R46	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Y1.-V1.-Grn. Audio Amp. Grid
R47	220KΩ	½	6R6407	BTS-220K	Red-Red-Y1. Audio Amp. Plate-See Note 10
R48	220KΩ	½	6R6407	BTS-220K	Red-Red-Y1. Audio Amp. Decoupling
R49	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Audio Output Grid-See Note 10
R50	330Ω	½	6h6022	BW-½-330	Or.-Or.-Br. Audio Output Cathode
R51	100KΩ	½	6R6031	BTS-100K	Br.-Blk.-Y1. Clipper Grid-See Note 11
R52	10KΩ	½	6R6320	BTS-10K	Br.-Blk.-Or. Current Limiting
R53	1 Meg.	½	6R6046	BTS-1 Meg.	Br.-Blk.-Grn. Clipper Plate
R54	6800Ω	1	6R5691	BTA-6800	Blue-Gray-Red 2nd Clipper Plate
R55	15KΩ	½	6R6477	BTS-15K	Br.-Grn.-Or. AFC Coil Shunt
R56	15KΩ	½	6R6477	BTS-15K	Br.-Grn.-Or. Peaking-See Note 12
R57	10KΩ	1	6R6430	BTA-10K	Br.-Blk.-Or. Horiz. Block. Osc. Grid
R58	4700Ω	½	6R6080	BTS-4700	Y1.-V1.-Red " " " "
R59	220KΩ	2	6R488138	BT-2-220K	Red-Red-Y1. Bias Network
R60	330ΩΩ	½	6R5581	BTS-3300	Or.-Or.-Red AFC Cathode
R61	47KΩ	½	6R6048	BTS-47K	Y1.-V1.-Or. Integrator
R62	10KΩ	½	6R6320	BTS-10K	Br.-Blk.-Or. "
R63	100KΩ	½	6R6031	BTS-100K	Br.-Blk.-Y1. Feedback Network
R64	3.3 Meg.	1	6R6497	BTS-3.3 Meg.	Or.-Or.-Grn. Vert. Sweep Osc. Grid
R65	2.2 Meg.	1	6R6433	BTA-2.2 Meg.	Red-Red-Grn. Vert. Sweep Osc. Plate-See Note 13
R66	10 Meg.	½	6R5622	BTS-10 Meg.	Br.-Blk.-Blue Feedback
R67	10 Meg.	½	6R5622	BTS-10 Meg.	Br.-Blk.-Blue Feedback
R68	10 Meg.	½	6R5622	BTS-10 Meg.	Br.-Blk.-Blue Vert. Sweep Output Grid
R69	10 Meg.	½	6R5622	BTS-10 Meg.	Br.-Blk.-Blue " " "
R70	100KΩ	½	6R6031	BTS-100K	Br.-Blk.-Y1. Voltage Divider
R71	220KΩ	½	6R6407	BTS-220K	Red-Red-Y1. " "
R72	4.7 Meg.	1	6R476018	BTA-4.7 Meg.	Y1.-V1.-Grn. Vert. Sweep Output Plate-See Note 14
R73	4.7 Meg.	1	6R476018	BTA-4.7 Meg.	Y1.-V1.-Grn. " " " " " " "
R74	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Picture Tube Cathode-See Note 17
R75	4.7 Meg.	½	6R6446		Y1.-V1.-Grn. Deflection Plate Load
R76	4.7 Meg.	½	6R6446		Y1.-V1.-Grn. " " "
R77	4.7 Meg.	½	6R6446		Y1.-V1.-Grn. " " "
R78	4.7 Meg.	½	6R6446		Y1.-V1.-Grn. " " "
R79	1 Meg.	½	6R6046		Br.-Blk.-Grn. Voltage Dropping
R80	1 Meg.	½	6R6046		Br.-Blk.-Grn. " "
R81	2.2 Meg.	1	6R2011		Red-Red-Grn. " "
R82	2.2 Meg.	1	6R2011		Red-Red-Grn. " "
R83	2.2 Meg.	1	6R2011		Red-Red-Grn. " "
R84	2.2 Meg.	1	6R2011		Red-Red-Grn. " "
R85	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Isolation
R86	150KΩ	½	6R6398	BTS-150K	Br.-Grn.-Y1. Hi. V. Osc. Grid
R87	100Ω	1	6R6415		Br.-Blk.-Br. Hi. V. Osc. Cathode
R88	33Ω	½	6R2036		Or.-Or.-Blk. Parasitic Suppressor
R89	100Ω	2	6R3963		Br.-Blk.-Br. Hi. V. Decoupling-See Note 15
R90	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Isolation
R91	10KΩ	½	6R6320	BTS-10K	Br.-Blk.-Or. 2nd Clipper Grid
R92	39KΩ	½	6R6588	BTS-39K	Or.-Wh.-Or. Horiz. Osc. Trans. Pri. Shunt
R93	27KΩ	½	6R6434	BTS-27K	Red-V1.-Or. Horiz. Osc. Trans. Sec. Shunt
R94	18KΩ	½	6R6591	BTS-18K	Br.-Gray-Or. Horiz. Osc. Grid
R95	10KΩ	½	6R6320	BTS-10K	Br.-Blk.-Or. Differentiator
R96	470KΩ	½	6R6377	BTS-470K	Y1.-V1.-Y1. Vert. Block. Osc. Grid-See Note 15
R97	3.3 Meg.	½	6R6497	BTS-3.3 Meg.	Or.-Or.-Grn. Vert. Block. Osc. Plate
R98	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Y1.-V1.-Grn. Feedback-See Note 16
R99	15 Meg.	½	6R476065	BTS-15 Meg.	Br.-Grn.-Blue " " " "

Note 1-Not used in Chassis TS-4J.
Note 2-Chassis TS-4J uses 56Ω in this application.
Note 3-Chassis TS-4J uses 2.2 Meg. in this application. In Chassis TS-4B & C this part is located in the 2nd Det. circuit can.
Note 4-Not used in Chassis TS-4B, C, D & E.
Note 5-Used in Chassis TS-4B, C, D & E only.
Note 6-Chassis TS-4B, C, D, E uses 8200Ω in this application.
Note 7-Not used in Chassis TS-4B, C, D, E & J.
Note 8-Chassis TS-4J uses 330Ω in this application. TS-4C uses 380Ω.
Note 9-Chassis TS-4B uses 10KΩ in this application.
Note 10-This part is incorporated in a coupling plate in Chassis TS-4D.
Note 11-Chassis TS-4J uses 1 Meg. for this application.
Note 12-Chassis TS-4E & F use 6800Ω in this application.
Note 13-Chassis TS-4E uses 3.3 Meg. in this application.
Note 14-Chassis TS-4J uses 6.8 Meg. in this application.
Note 15-Chassis TS-4D uses 3.3 Meg. in this application.
Note 16-Chassis TS-4D use 10 Meg. in this application.
Note 17-Early chassis models TS-4D use 1 Meg. in this application. TS-4B & C uses 2.2 Meg.
Note 18-Chassis TS-4B & C use L39 in place of R89.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.	REPLACEMENT DATA: MERIT PART No.	NOTES
T1	60Ω	170Ω	24B480209				Horiz. Block Osc. Trans.
T2			24B470154				Vert. Block Osc. Trans.§
T3A	260Ω		25B4d4819				Vert. Sweep Push-Pull Trans.
			(or)				"
B	210Ω		25B90138				"
T4	170Ω	60Ω	24B480209				AFC Coupling Trans.†
T5	4.5Ω	SEC. 1 40Ω SEC. 2 0Ω	1X4712124				Hi Voltage Trans.

†Not used in Chassis TS-4B, C & D.
§This transformer is not used in Chassis TS-4D, E, F, G, H. J.
‡This part number includes 1300 MFD. capacitor (Item C77).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
T6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	T2S45	[illegible]	

PARTS LIST AND DESCRIPTIONS CONTINUED ON PAGE 11.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

When performing alignment with receiver out of cabinet, it is necessary to connect a jumper across terminals 1 & 14 of the cathode ray tube socket to complete the heater circuit. It is recommended that the high voltage be disabled during alignment to eliminate the shock hazard. This may be done by removing the 25L6 Hi Voltage Oscillator and substituting a 75Ω 10 Watt resistor across Pins 2 & 7 to maintain continuity in the filament string. The high voltage may also be disabled by disconnecting and taping the B++ lead supplying the plate and screen grid of the 25L6 Hi Voltage Oscillator. Reconnect this lead after alignment is completed.

NEVER GROUND THE RECEIVER DURING TESTING OPERATIONS OR INSTALLATION UNLESS ISOLATION TRANSFORMER IS USED. However, a grounded coaxial line may be connected to the antenna terminal marked "G".

AUDIO TAKE-OFF & RATIO DETECTOR ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1	1000MMF	High side to Pin 1 6AU6 (V6). Low side to B-.	4.5MC (No Mod.)	Any	DC probe in series with 10KΩ to Point (A). Common lead to B-.	A1,A2	Adjust for maximum deflection.
2	1000MMF	"	"	"	DC probe in series with 10KΩ to Point (A). Common lead to B-.	A3	Adjust for zero reading. A positive or negative reading on either side designates correct setting.

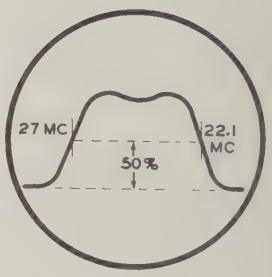


FIG. 1

IF AMPLIFIER ALIGNMENT

If difficulty is experienced in observing marker, a 1000 MFD capacitor should be connected across the oscilloscope input terminals.

If distorted or unstable pattern is obtained during IF Alignment, it may be necessary to stop the oscillator by connecting a 1000 MMFD capacitor from the grid (Pin 7) of V2 to B-.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3	Direct	High side to Pin 1 6AG5 (V3). Low side to B-.	25MC (12MC sweep)	25MC	Any	Vertical amp. to Point (D). Low side to B-.	A4	Adjust for maximum amplitude at marker.
4	"	"	"	23MC	"	"	A5	"
5	"	"	"	27MC	"	"	A6	Adjust A6 to place 27MC marker 50% up the high freq. side of the response pattern. (See Fig. 1)
6	"	"	"	22.1MC	"	"	A5	Adjust A5 until 22.1 MC marker is 50% up the low freq. side of the response pattern. (See Fig. 1)
7	"	"	"	22.1MC & 27MC	"	"	A4	Adjust A4 for flat top or symmetrical curve. If necessary, repeat Steps 3, 4, 5, 6 & 7 to obtain desired pattern as per Fig. 1.

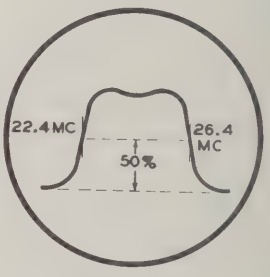


FIG. 2

IST IF TRANSFORMER ALIGNMENT

The primary of L27 affects the low frequency side of the waveform and the secondary affects the high frequency side. The adjustments A7 & A8 should be done simultaneously. The object is to obtain as flat and wide a response curve as possible with as much gain as possible. The 50% markers give a visual means of determining the band width. The contrast control should be set at 80% rotation toward maximum gain while adjusting this transformer. It should be noted that Figures 1 & 2 are similar, the main difference being that the sides of the pattern are steeper in Figure 2.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8	Direct	High side to Pin 2 12AT7 (V2). Low side to bottom end of R17.	25MC (12MC Sweep)	22.4MC &26.4MC	Any	Vertical amp. to Point (D). Low side to B-.	A7,A8	Adjust A7 & A8 until markers are 50% up their respective sides of the pattern per Fig. 2.

OSCILLATOR ALIGNMENT

Reconnect oscillator if disabled during IF Alignment. Output of signal generator and vertical amplifier of scope should be at maximum gain. Synchronize scope to 60 ∿ or a harmonic thereof. If receiver has fine tuning control, pre-set this control at mid-capacity.

On Chassis TS4B, C, D & E disregard "A" adjustment points. Refer to line drawing showing antenna, RF and oscillator alignment points for these chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST (TS-4F, G, H&J ONLY)	REMARKS
9	Direct	High side to Pin 1 6AG5 (V1). Low side to junction of R14 & C27.	81.45MC (No Mod.) 87.45MC	2 or 3	Vertical amp. to Pin 3 12AT7 (V2). Low side to B-.	A9	Adjust for zero beat. This is indicated by sharply defined trace that appears between two wide traces as coil is tuned through resonance.
10	"	"	93.45MC	4	"	A10	"
11	"	"	103.45MC	5	"	A11	"
12	"	"	109.45MC	6	"	A12	"
13	"	"	152.35MC	7	"	A13	"
14	"	"	158.35MC 164.35MC	8 or 9	"	A14	"
15	"	"	170.35MC 176.35MC	10 or 11	"	A15	"
16	"	"	182.35MC 188.35MC	12 or 13	"	A16	"

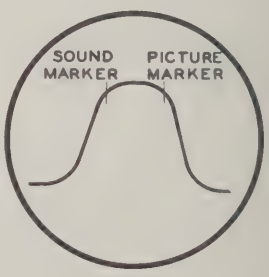


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

ANTENNA & RF COIL ALIGNMENT

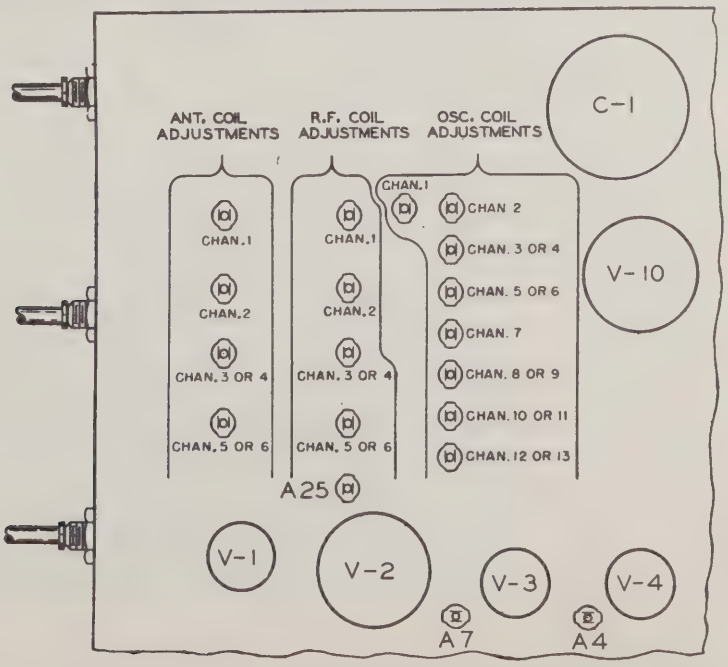
Disconnect L26 from cathode of oscillator tube (Pin 8-12AT7 V2). Note that the antenna coils are tuned first for the picture carrier frequency and then the RF coils are adjusted second for the sound carrier frequency.

On chassis TS-4B, C, D & E disregard "A" adjustment points. Refer to line drawing showing antenna, RF and oscillator alignment points for these chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST (TS-4F, G H&J ONLY)	REMARKS
17A	Direct	High side to bottom "A" on antenna terminal strip. Low side to "G"	57MC (10MC sweep)	55.25MC & 59.75MC	2	Across R18. (Converter cathode resistor)	A18, A17	Adjust for maximum amplitude & symmetry and for placement of markers as per Fig. 3
17B	Direct	"	63MC (10MC sweep)	61.25MC &65.75MC	3	"	A18, A17	"
18	Direct	"	69MC (10MC sweep)	67.25MC &71.75MC	4	"	A20, A19	"
	Channels 5 & 6 are aligned with AM Signal Generator instead of sweep generator.							
19	Direct	High side to bottom "A" on antenna terminal strip. Low side to "G"	Not Used	77.25MC (400 ∿ 30% Mod.) 81.75MC (400 ∿ 30% Mod.)	5	Across R18. (Converter cathode resistor)	A22, A21	Adjust for maximum amplitude.
20	Direct	"	"	83.25MC (400 ∿ 30% Mod.) 87.75MC (400 ∿ 30% Mod.)	6	"	A24, A23	"
21	There are no antenna coil adjustments for Channels 7 through 13. The RF Coils for these channels are adjusted as follows, using AM Signal Generator and Oscilloscope connected as above. A. If Channels 3 & 6 have been set up adjust A25 for Channels 8, 10 & 12 to maximum response at 195MC in Channel 10. B. If Channels 2, 4 & 5 have been set up adjust A25 for Channels 7, 9, 11 & 13 to maximum response at 189MC in Channel 9.							

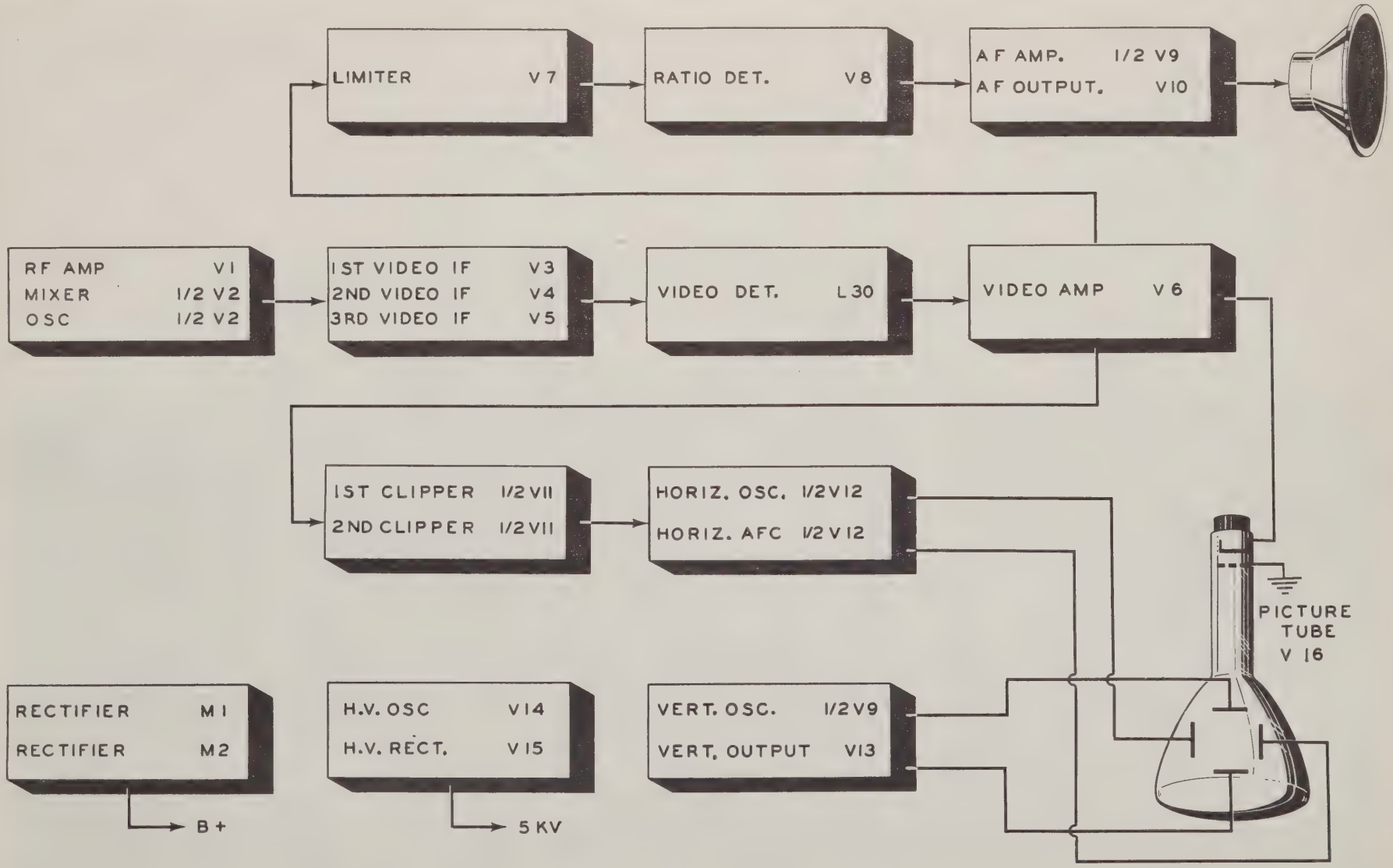
ALTERNATE ANTENNA & RF COIL ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
17A	Direct	High side to lower "A" terminal on ant. terminal strip. Low side to "G".	55.25MC (No Mod.) & 59.75MC (No Mod.)	2	DC probe to Point ◇. Common lead to B-.	A18 A17	Adjust for maximum deflection.
B	Direct	"	61.25MC (No Mod.) & 65.75MC (No Mod.)	3	"	A18 A17	"
18	Direct	"	67.25MC (No Mod.) & 71.75MC (No Mod.)	4	"	A20 A19	"
19	Direct	"	77.25MC (No Mod.) & 81.75MC (No Mod.)	5	"	A22 A21	"
20	Direct	"	83.25MC (No Mod.) & 87.75MC (No Mod.)	6	"	A24 A23	"
	For Channels 7 through 13 follow same procedure as outline in Step 21. Instead of a scope being used as an output indicator a VTVM connected as above may be used.						



ANT., RF. & OSC. COIL ADJUSTMENTS FOR CHASSIS TS-4B,C,D&E

MOTOROLA MODEL VT71



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L1A	Ant. Input	.2Ω		24A482232		Used in Chassis TS-4D, E, F, G, H & J.
B	" "			24A471186		Used in Chassis TS-4B & C.
L2A	Ant. Coil	0Ω		24K484872		Channel 2 & 3. Used in Chassis TS-4F, G, H and J.
B	" "	0Ω		24B90177		Channel 1. Used in Chassis TS-4B, C, D & E.
L3A	" "	0Ω		24K478293		Channel 4. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90178		Channel 2. Used in Chassis TS-4B, C, D & E.
L4A	" "	0Ω		24K478294		Channel 5. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90179		Channel 3 & 4. Used in Chassis TS-4B.
C	" "	0Ω		24K478293		Channel 3 & 4. Used in Chassis TS-4C, D & E.
L5A	" "	0Ω		24K478294		Channel 6. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90180		Channel 5 & 6. Used in Chassis TS-4B.
C	" "	0Ω		24K478294		Channel 5 & 6. Used in Chassis TS-4C, D & E.
L6	" "	0Ω		24A471374		Channels 10 & 11.
L7	" "	0Ω		24A471374		Channels 8 & 9.
L8	" "	0Ω		24A471374		Channel 7.
L9A	RF Coil	0Ω		24K484873		Channels 2 & 3. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90182		Channel 1. Used in Chassis TS-4B, C, D & E.
L10A	" "	0Ω		24K478292		Channel 4. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90183		Channel 2. Used in Chassis TS-4B, C, D & E.
L11A	" "	0Ω		24K90185		Channel 5. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90184		Channels 3 & 4. Used in Chassis TS-4B.
C	" "	0Ω		24K478292		Channels 3 & 4. Used in Chassis TS-4C, D & E.
L12	" "	0Ω		24K90185		Channels 5 & 6. (TS-4F, G, H & J channel 6 only)
L13	" "	0Ω		24A471372		Channels 12 & 13.
L14	" "	0Ω		24A471373		Channels 10 & 11.
L15	" "	0Ω		24A471373		Channels 8 & 9.
L16	" "	0Ω		24A471373		Channel 7.
L17	RF Choke	0Ω		24A90064		
L18A	Osc. Coil	0Ω		24K484874		Channels 2 & 3. Used in Chassis TS-4F, G, H & J.
B	" "	0Ω		24K90187		Channel 1. Used in Chassis TS-4B, C, D & E.
L19A	" "	0Ω		24K489003		Channel 4. Used in Chassis TS-4H & J.
B	" "	0Ω		24K90188		Channel 2. Used in Chassis TS-4B, C, D & E.
C	" "	0Ω		24K90189		Channel 4. Used in Chassis TS-4F, & G.
L20A	" "	0Ω		24K489004		Channel 5. Used in Chassis TS-4H & J.
B	" "	0Ω		24K90189		Channel 3 & 4. Used in Chassis TS-4B, C, D & E.
C	" "	0Ω		24K90190		Channel 5. Used in Chassis TS-4F & G.
L21A	" "	0Ω		24K489004		Channel 6. Used in Chassis TS-4H & J.
B	" "	0Ω		24K90190		Channel 5 & 6. Used in Chassis TS-4B, C, D & E (TS-4F & TS-4G, Channel 6).
L22A	" "	0Ω		24A489188		Channel 7. Used in Chassis TS-4H & J.
B	" "	0Ω		24A471370		Channel 7. Used in Chassis TS-4B, C, D, E, F & G
L23A	" "	0Ω		24A485442		Channel 8 & 9. Used in Chassis TS-4H and J.
B	" "	0Ω		24A471368		Channels 8 & 9. Used in Chassis TS-4B.
C	" "	0Ω		24A478282		Channels 8 & 9. Used in Chassis TS-4C, D, E, F & G.
L24A	" "	0Ω		24A489067		Channel 10 & 11. Used in Chassis TS-4H & J
B	" "	0Ω		24A471367		Channel 10 & 11. Used in Chassis TS-4B, C, D, E, F & G.
L25A	" "	0Ω		24A485443		Channel 12 & 13. Used in Chassis TS-4H & J.
B	" "	0Ω		24A471369		Channel 12 & 13. Used in Chassis TS-4B.
C	" "	0Ω		24A478283		Channel 12 & 13. Used in Chassis TS-4C, D, E, F & G.
L26	RF Choke	.1Ω		24A90193		
L27	1st IF	.6Ω	.4Ω	24B90192		
L28	2nd IF	.3Ω		24K470313		
L29	3rd IF	.3Ω		24A90197		
L30A	2nd Det. Assy.			1X482133		Chassis TS-4D, E, F, G, H & J. Less L30B.
B	4th IF	.2Ω		24A470314		
C	2nd Det. Assy.			1X470396		Chassis TS-4B & C. Less L30B.
L31	Sound Take-Off	1Ω		24A470159		See Note
L32A	Peaking	15Ω		24A470745		Wound on 100KΩ resistor. Used in Chassis TS-4F, G, H and J.
B	"			24A470745		Wound on 39KΩ resistor. Used in Chassis TS-4B, C, D & E.
L33	"	15Ω		24A470744		
L34	Ratio Det.	3Ω	.6Ω	24B470316		

COILS (CONT.)

L36	RF Fil. Chk.	.1Ω		24A90064		
L36	" " "	.1Ω		24A90064		
L37	" " "	.1Ω		24A90064		
L38	" " "	.1Ω		24A90064		
L39	RF Choke			24A471242		Used in Chassis TS-4B & C only.
L40	Ant. Input Filter			24A90194		" " " " " "

Note-On Chassis TS-4F, G & H this coil is located in the screen circuit of the video amp. On all other chassis it is connected in the grid circuit of the Sound IF Limiter.

SPEAKER

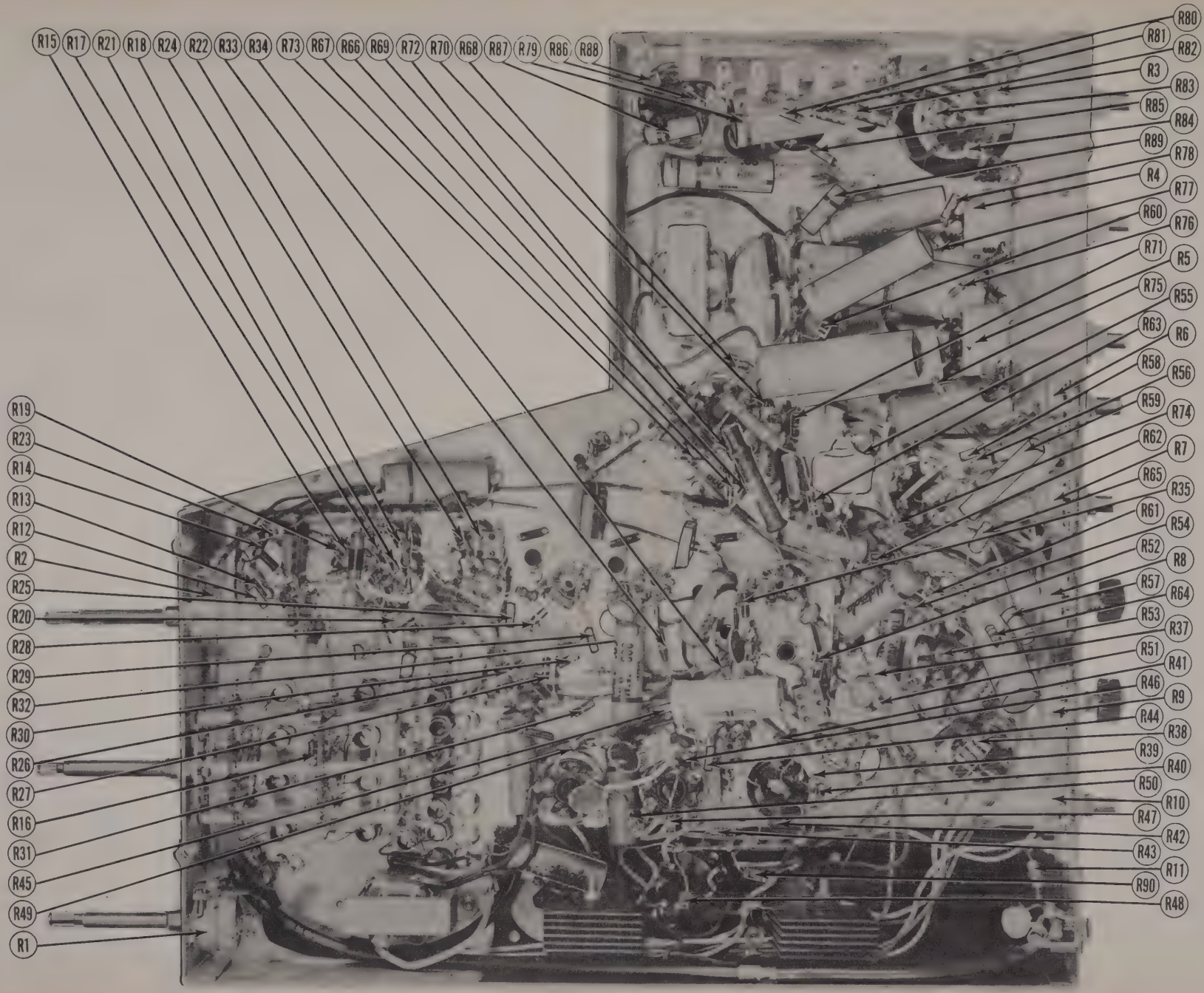
ITEM No.	RATING FIELD RES.	RATING V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1A	PM	2.2Ω	50B471219	ST-109 Mod. P6-W	[illegible]	
SP1B			50b471322			Alternate Speaker
	CONE DIA.	V. C. DIA.				
SP2	6"	3/4"				

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA MOTOROLA PART No.			NOTES
M1	110 MA.	48B470395 or 471350			
M2	110 MA.				

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3A	Switch	1X489168	Station Selector used in Chassis TS-4H & J.
B	"	1X471377	Station Selector used in Chassis TS-4B, C, D, E, F & G
M4	Plug, Line Cord	28K471323	
M5	Ballast Tube	17A470303	
	Core, Iron and Screw	46A470302	L34 Sec. used in all chassis.
	" " " "	46A70023	L34 Pri. used in all chassis.
	" " " "	46K480256	Bottom of L27, used in all chassis.
	Core, Iron, Copper & Screw	46A471363	L13 used in all chassis. Ant., RF and Osc. Coils.
	Core, Brass and Screw	46A478242	Antenna, RF and Osc. Coils
	Core, Iron & Screw	46A470310	Antenna, RF, Osc. and IF Coils, and top of L27.
	Socket and Leads Assy.	1X478281	Picture Tube
	Escutcheon	13K485496	Channel Indicator. Paper for Brown Cabinets. Used in Chassis TS-4F, G and H.
	"	13B484875	Channel Indicator. Paper for Blonde Cabinets. Used in Chassis TS-4F, G & H.
	1N34 Crystal	48A90173	Video Detector
	Cabinet	16K471438	Blonde for VT71B (Chassis TS-4B, C, D & E).
	"	16K478257	Brown Mahogany for VT71MB (Chassis TS-4B, C, D & E).
	"	16K478258	Red Mahogany for VT71M (Chassis TS-4B, C, D & E).
	"	16K471286	Walnut for VT71 (Chassis TS-4B, C, D & E).
	"	16K489079	Blonde for VT71B-A (Chassis TS-4F, G, H & J).
	"	16K489080	Brown Mahogany for VT71MB-A (Chassis TS-4F, G, H & J).
	"	16K489081	Red-Mahogany for VT71M-A (Chassis TS-4F, G, H & J).
	"	16K489078	Walnut for VT71-A (Chassis TS-4F, G, H & J)
	Knob	36K471545	Walnut Plastic-Plain
	"	36K471324	" " -With Dot
	"	36K478251	Mahogany Plastic-Plain
	"	36K478252	" " -With Dot
	"	36K478201	Tan Plastic-Plain
	"	36K478202	" " -With Dot
	"	36K485449	Walnut Plastic-For Channel Selector Switch (TS-4H & J)
	"	36K485450	Tan Plastic-For Channel Selector Switch (TS-4H & J)
	"	36B485448	Mahogany Plastic-For Channel Selector Switch (TS-4H & J)
	"	36K485446	Walnut Plastic-For Fine Tuning (TS-4H & J)
	"	36K485447	Tan Plastic-For Fine Tuning (TS-4H & J)
	"	36A485445	Mahogany Plastic-For Fine Tuning (TS-4H & J)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MOTOROLA
MODEL VT71

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	125VDC	125VDC	50VAC	44VAC	215VDC	215VDC	125VDC	-	-
V 2	12AT7	210VDC	0V.	4VDC	39VAC	39VAC	250VDC	-3.2VDC§	0V.	44VAC
V 3	6AG5	-.6VDC	.1VDC	39VAC	34VAC	70VDC	110VDC	.1VDC	-	-
V 4	6AG5	28VDC	110VDC	32VAC	25VAC	150VDC	215VDC	110VDC	-	-
V 5	6AG5	125VDC	125VDC	25VAC	19VAC	200VDC	200VDC	125VDC	-	-
V 6	6AU6	-.4VDC	0V.	19VAC	12VAC	90VDC	165VDC	0V.	-	-
V 7	6AU6	95VDC	115VDC	50VAC	55VAC	220VDC	220VDC	115VDC	-	-
V 8	6AL5	.1VDC	-.1VDC	13VAC	7VAC	-.1VDC	0V.	-.1VDC	-	-
V 9	12SN7GT	-.5VDC	19VDC	0V.	-.7VDC	7VDC 24VDC	0V.	20VAC	7VAC	-
V 10	25L6GT	0V.	54VAC	110VDC	120VDC	0V.	0V.	80VAC	10VDC	-
V 11	12SN7GT	-1VDC	21VDC	0V.	117VDC	188VDC	120VDC	34VAC	49VAC	-
V 12	12SN7GT	16.5VDC -44VDC	125VDC 225VDC	1.5VDC	-26.5VDC	-26.5VDC	2.8VDC	20VAC	34VAC	-
V 13	6SL7GT	-2.2VDC	†	0V.	-.5VDC	270VDC	0V.	53VAC	49VAC	-
V 14	25L6GT	0V.	53VAC	230VDC	230VDC	0V.	0V.	80VAC	3.2VDC	-
V 15	1B3GT	DO NOT MEASURE.								

	PINS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V 16	7JP4	0V.	60VDC 210VDC	0V.	-	†	-	†	†	†	†	†	-	-	7VAC

†DO NOT MEASURE. CAN NOT MAKE ACCURATE MEASUREMENT DUE TO HIGH IMPEDANCE OF CIRCUIT.
§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	10KΩ**	1000Ω**	26Ω	33Ω	1200Ω*	1200Ω*	1000Ω**	-	-
V 2	12AT7	1.2MΩ*	33KΩ	2.7KΩ	22Ω	22Ω	1200Ω*	10KΩ	.3Ω	23Ω
V 3	6AG5	3 Meg.	33Ω	22Ω	15Ω	INF.*	INF.*	33Ω	-	-
V 4	6AG5	2.5 Meg.	INF.	15Ω	14Ω	6KΩ*	1200Ω*	INF.	-	-
V 5	6AG5	1000Ω**	1000Ω**	14Ω	10Ω	1200Ω*	1200Ω*	1000Ω**	-	-
V 6	6AU6	1 Meg.	0Ω	1Ω	5Ω	12KΩ*	4.8KΩ*	0Ω	-	-
V 7	6AU6	470KΩ**	820Ω**	7Ω	30Ω	1200Ω*	12.0Ω*	820Ω**	-	-
V 8	6AL5	6.8KΩ	6.8KΩ	5Ω	2Ω	1 Meg.	470KΩ	1 Meg.	-	-
V 9	12SN7GT	4.7 Meg.	440KΩ*	0Ω	8.3 Meg. 3.3 Meg.	7.2 Meg.* 2.5 Meg.*	0Ω	11Ω	2Ω	-
V 10	25L6GT	INF.	30Ω	230Ω**	0Ω**	470KΩ	INF.	40Ω	330Ω	-
V 11	12SN7GT	2 Meg.	1 Meg.**	0Ω	10KΩ**	7KΩ*	0Ω**	2Ω	2.5Ω	-
V 12	12SN7GT	24KΩ 10KΩ	17KΩ* 800Ω*	210Ω	150KΩ*	150KΩ*	3.3KΩ	11Ω	20Ω	-
V 13	6SL7GT	10 Meg.	INF.	0Ω	10 Meg.	INF.	0Ω	27Ω	25Ω	-
V 14	25L6GT	INF.	27Ω	300Ω*	335Ω*	150KΩ	0Ω	36Ω	100Ω	-
V 15	1B3GT	INF.	INF.	INF.	INF.	INF.	INF.	INF.	INF.	TOP CAP 1200Ω*

	PINS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V 16	7JP4	0Ω	460KΩ* 700KΩ*	0Ω	INF.	INF.	INF.	INF.	INF.	INF.	INF.	INF.	INF.	INF.	2Ω

*MEASURED FROM JUNCTION OF M2 AND PIN 4 OF M5.
**MEASURED FROM POSITIVE TERMINAL OF C-3B.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms.

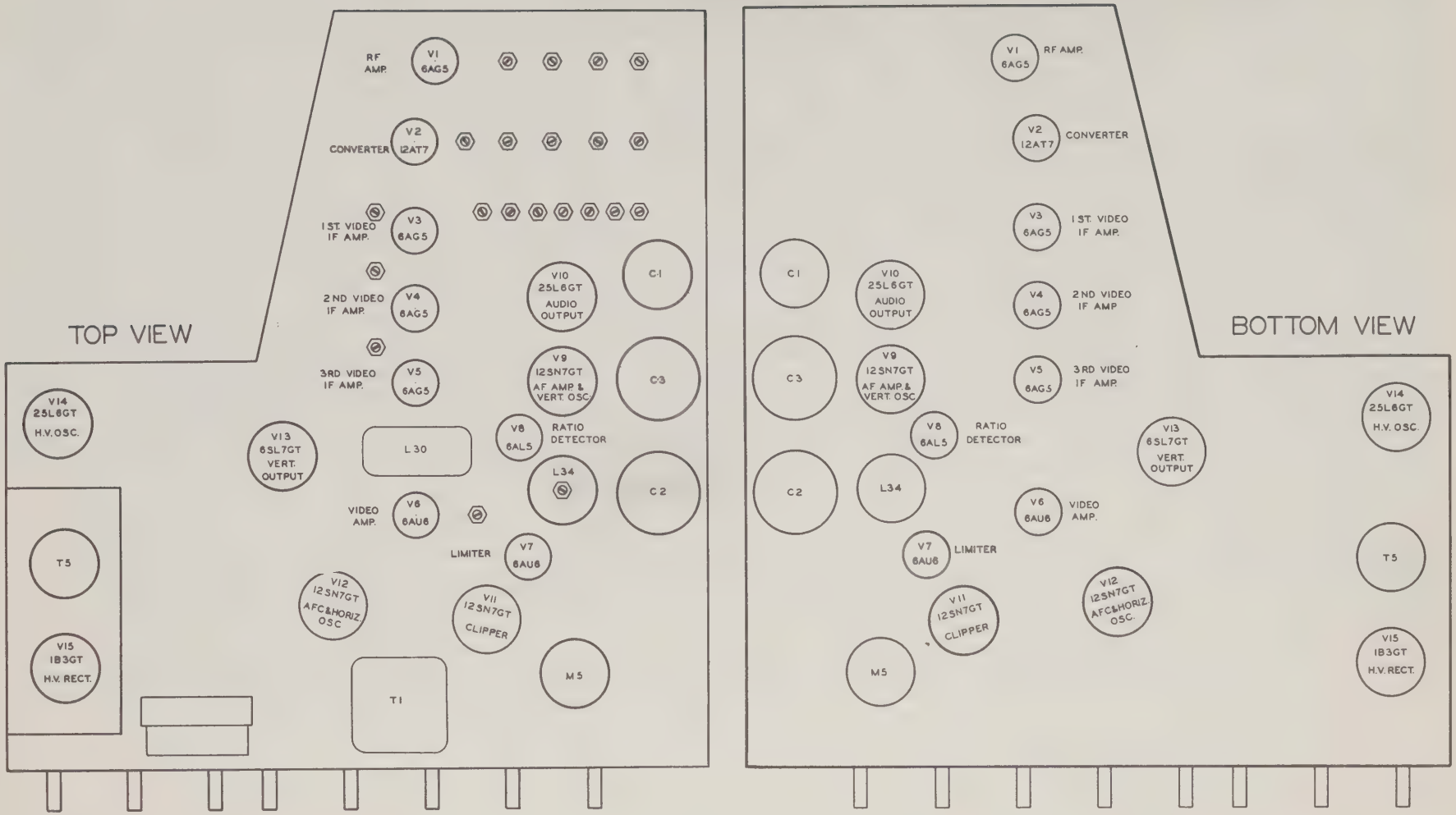
2 - Socket connections are shown as bottom views.

3 - Measured values are from socket pin to common negative unless otherwise stated.

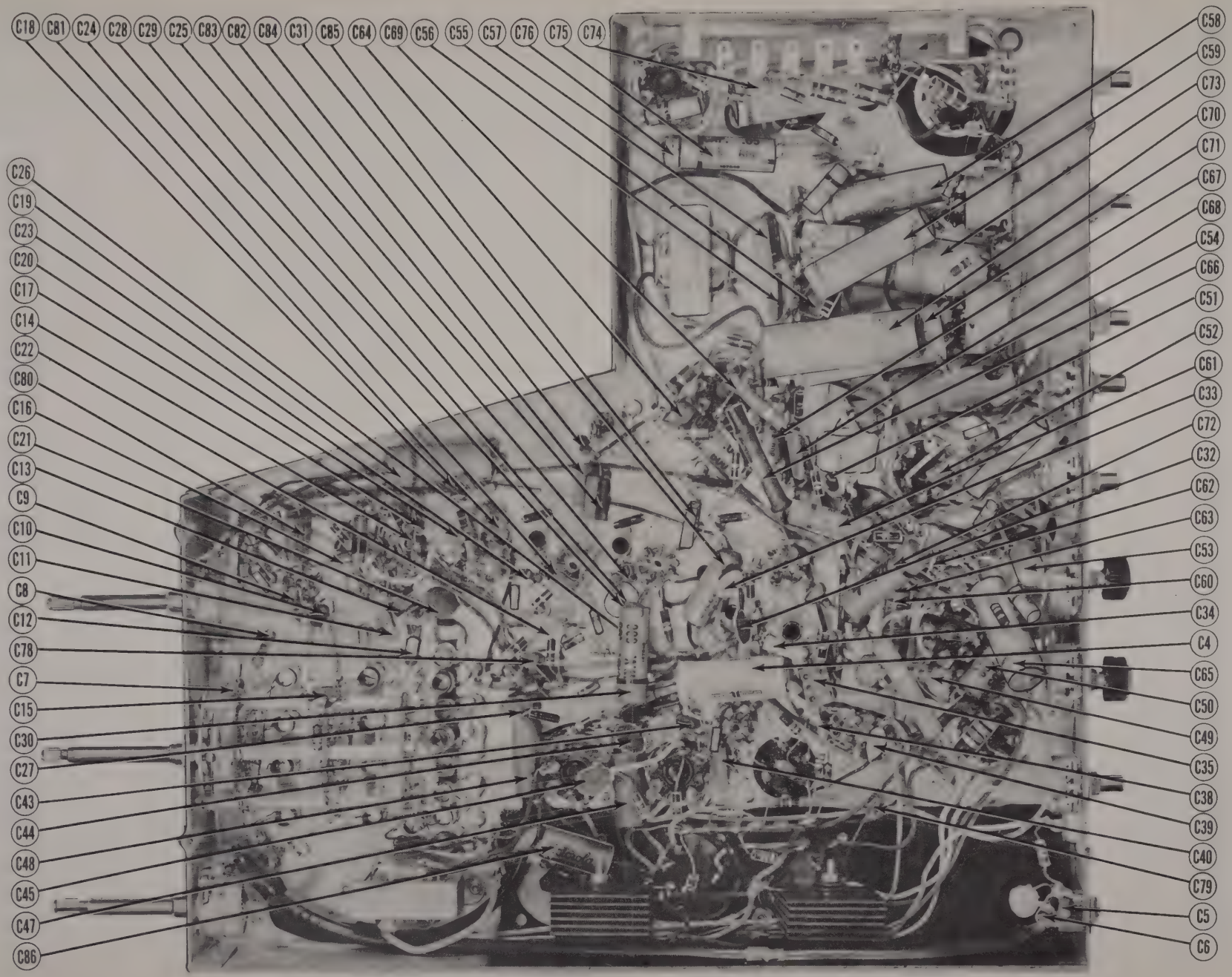
4 - Line voltage maintained at 117 volts for voltage readings.

5 - Front panels controls set at maximum.

6 - Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

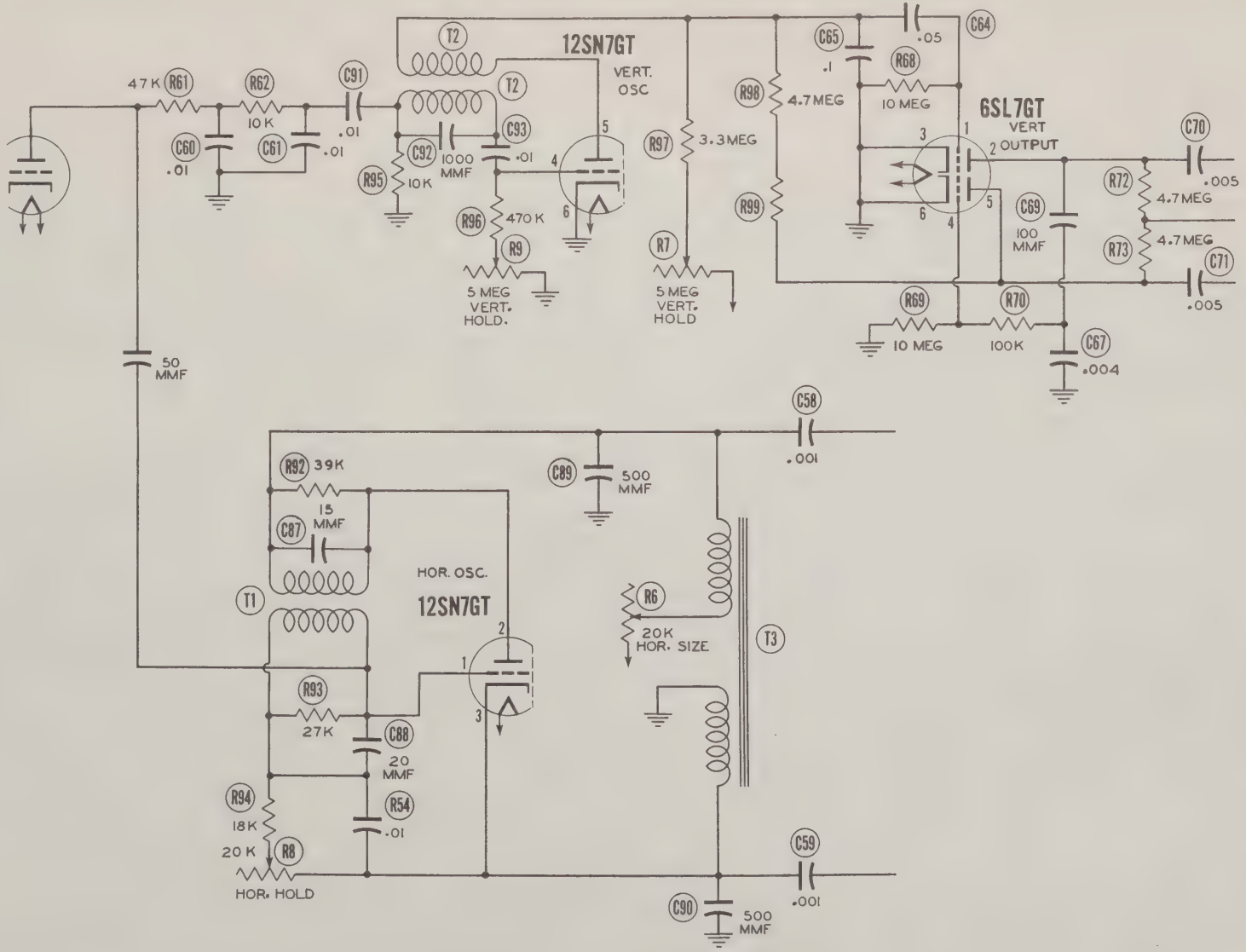


TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

MOTOROLA
MODEL VT71



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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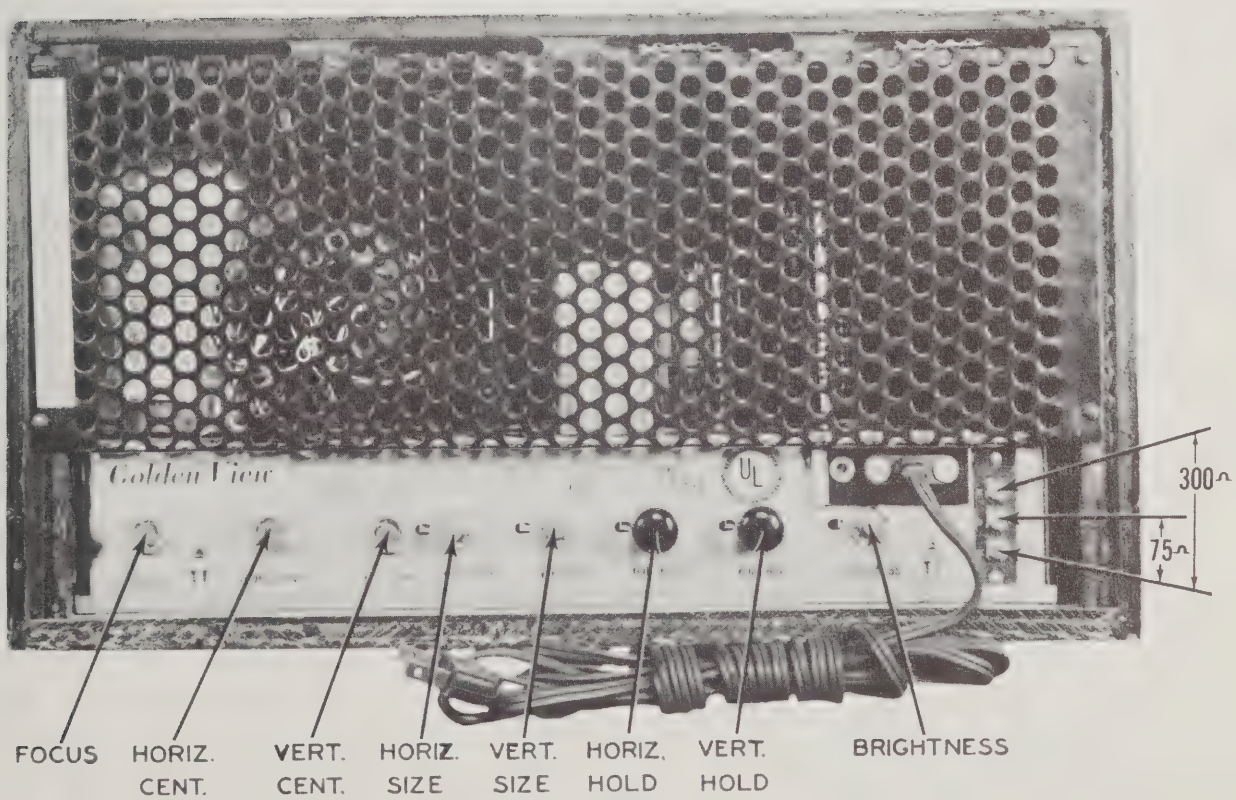
DISASSEMBLY INSTRUCTIONS

1. Remove 4 screws holding back panel and power interlock and remove.
2. Remove push on type knobs and 2 felt washers on front of receiver.
3. Unplug speaker leads.
4. Remove picture tube socket.
5. Remove 4 chassis bolts from bottom of cabinet.
6. Slide chassis out rear of cab.
7. Remove 4 nuts and lock washers on speaker and remove.

POSITIONING OF FEEDBACK SPRING ON H.V. RECTIFIER

Feedback to the grid of H. V. Oscillator tube is obtained by a capacitive coupling device consisting of a coil mounted around the envelope of the High Voltage Rectifier tube. The position of this spring is very critical and misplacement will result in very low or no high voltage.

For the old construction tube (8016) the lower edge of the spring should be 13/16" ± 1/32" from the top of the tube base. On the new type construction (1B3GT), the bottom edge of the spring should be 3/4" ± 1/32" from the top of the tube base.



CABINET-REAR VIEW

PHILCO MODELS
49-909, 49-1101

PHILCO MODELS
49-909, 49-1101

PHILCO MODEL 49-909

TRADE NAME	Philco, Models 49-909, 49-1101
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES(NINE)	Types, 12AU6 FM RF Amp., 14F8 FM Converter, 12AU7 AM Converter, 6BJ6 1st IF Amp., 6BJ6 2nd IF Amp., 19T8 Det.-AVC-AF, 50L6GT Power Output, (2) 117Z3 Rectifier.
POWER SUPPLY	105-120 Volts AC RATING .53 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis , Indiana

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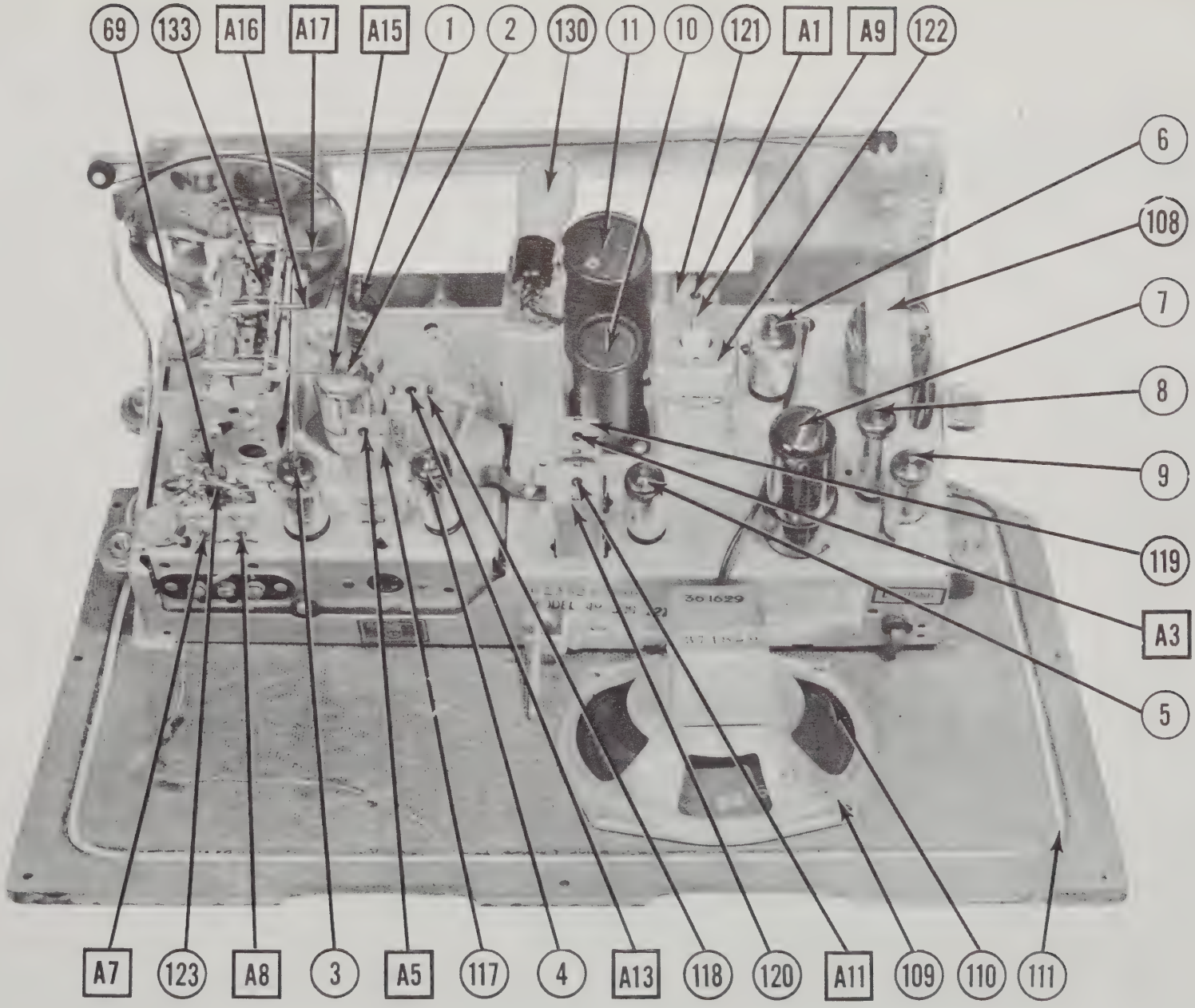
2/49-#493-17 SET #55-FOLDER #17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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM RF Amp.	12AU6	12AU6	7BK	
2	FM Converter	14F8	14F8	8BW	
3	AM Converter	12AU7	12AU7	9A	
4	1st IF Amp.	6BJ6	6BJ6	7CM	
5	2nd IF Amp.	6BJ6	6BJ6	7CM	
6	Det.-AVC-AF	19T8	19T8		
7	Power Output	50L6GT	50L6GT	7AC	
8	Rectifier	117Z3	117Z3	4BR	
9	"	117Z3	117Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
10	40	200	30-2568-28	AF44F*	UP4025	DY-2x20-350*	D13318	Voltage Doubler
11A	40	300	30-2568-24	AF88J	UP222245*	DY-403*	D13307	● Filter
B	40	300		PRS450/20-20	BR1235	M-10-350		■ "
C	20	300						▲ "
D	10	300						AF Plate Decoupling
12	2	50	30-2417-7		BR245	M-4-150	D13330	Stabilizing Cap.
13	.04	400	45-3500-2	484-05	GT6S4	ST-6-04	TC-14	Line Filter
14	.05	400	39-9851-6	484-05	GT4S5	ST-4-05	TC-15	Line Isolation-Note 1
15	.03	400	45-3500-1	484-03	GT4S3	ST-6-03	72P1	Line Isolation
16	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	Output Plate Bypass
17	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	Audio Coupling
18	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	" "
19	.02	400	61-0108	484-02	GT4S2	ST-4-02	TC-12	" "
20	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	Tone Compensation
21	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	" "
22	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	Diode Load Cap.
23	.01	600	61-0120	684-01	GT6S1	ST-6-01	TC-11	RF Bypass
24	.01	600	61-0120	684-01	GT6S1	ST-6-01	TC-11	2nd IF Plate Decoup.
25	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	2nd IF Screen Bypass
26	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	2nd IF Cathode Byp.
27	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	1st IF Decoupling
28	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	Fil. Bypass
29	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	AVC Filter
30	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	" "
31	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	AM Conv. Decoupling
32	.05	400	61-0122	484-05	GT4S5	ST-4-05	TC-15	RF Bypass
33	.03	400	45-3500-1	484-03	GT4S3	ST-6-03	TC-13	" "
34	.01	600	61-0120	684-01	GT6S1	ST-6-01	TC-11	FM Conv. Decoupling
35	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	AM Osc. Tun. Cap. Iso.
36	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	RF Bypass-See Note 2
37	220	300	62-122001001	1468-00025	5W5T25	MO.5-325	1FM-325	Output Grid Bypass-Cer.
38	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass "
39	51	300		1468-00005	5W5Q5	MO.5-45	1FM-45	AF Grid Bypass-Cer.-Note 2
40	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass -Cer.
41	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	FM Diode RF Filter "
42	1500	300	62-215001001	1467-0015	1W5D15	MW.5-215	1FM-215	De-emphasis "
43	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass-Cer-Note 2
44	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	Fil. Bypass "
45	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass "
46	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	" " "
47	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	Fil. Bypass "
48	100	300	62-110009001	1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass "
49	1500	300	62-215001001	1467-0015	1W5D15	MW.5-215	1FM-215	FM Osc. Decoup. "
50	220	300	62-122001001	1468-00025	5W5T25	MO.5-325	1FM-325	FM Osc. Coupling "
51	51	300	62-051009001	1468-00005	5W5Q5	MO.5-45	1FM-45	FM Osc. Grid Cap. "
52	220	300	62-122001001	1468-00025	5W5T25	MO.5-325	1FM-325	FM Osc. Feedback "
53	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	FM Conv. Cath. Byp. "
54	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	Fil. Bypass "
55	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	" " "
56	220	300	62-122001001	1468-00025	5W5T25	MO.5-325	1FM-325	FM RF Coupling "
57	51	300	62-051009001	1468-00005	5W5Q5	MO.5-45	1FM-45	" " " "
58	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	FM RF Screen Bypass "
59	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	FM RF Cathode Bypass "
60	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	RF Bypass "
61	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	Fil. Bypass "

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
108	4000Ω	3.5Ω	410Ω	.7Ω	32-6242-5	A-3849	T2887	A-2902	

SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: VC IMP.	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
109A	PM	3.5Ω	36-1629	ST-1071 Mod. P5-V	52A1	Model 49-909 †Use adaptor baffle.
B	PM	3.4Ω	36-1636-1	ST-115 Mod. P8-V	8A21	Model 49-1101
	CONE DIA.	VC DIA.				
110A	5-1/8"	9/16"				
B	7-5/16"	3/4"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: MEISSNER PART No.	
111A	Loop Ant.		1.8Ω	32-4052-27		Model 49-909
B	" "			76-3583-5		Model 49-1101
112A	Ant. Load. Coil		1Ω	32-4217-1		Model 49-909
B	"			32-4033-10		Model 49-1101
113	FM Ant.Coil		0Ω	32-4158-1		
114	FM RF Coil		0Ω	32-4159-1		
115	BC Osc.Coil		11Ω	32-4221-1	14-1060	
116	FM " "		0Ω	32-4018-5		
117	1st IF-AM	8.5Ω‡	19Ω	32-4256		‡20Ω tertiary winding
118	" " FM	1Ω	1.2Ω	32-4257		
119	2nd IF-AM	10Ω	10Ω	32-4160-3		
120	" " FM	1Ω	1Ω	32-4257-1		
121	3rd IF AM	16Ω	15.8Ω	32-4240-2		
122	FM RatioDet.	1.5Ω	0Ω	32-4261-1		
123	RF Choke		.5Ω	32-4061-2		
124	" "		.5Ω	32-4061-2		
125	RF Plate Choke		.5Ω	32-4061-2		
126	"		.5Ω	32-4061-2		
127	RF Choke		.5Ω	32-4061-2		
128	Fil. Choke		1.5Ω	32-4143-4		
129	Line Iso. Choke		.5Ω	32-4061-2		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
130	Screw	110			34-2605		

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
131	Switch	42-1834-2	Band
132	"	42-1745-2	Accessory
133	2 Gang Var. Cap.	31-2724-3	(18-522MMF, 13-247MMF)
A7	Trimmer Strip	31-6476-18	BC Osc. Adj.
A8			BC Ant. Adj.
	Cabinet	10722	Model 49-909
	"	10701A	Model 49-1101
	Dial Scale	54-5025	Model 49-909
	" "	54-5027	Model 49-1101
	Dial Pointer	56-5630-2FCP	Model 49-909
	" "	56-5630-3FCP	Model 49-1101
	Knob	54-4466-1	Model 49-909 (4 Required)
	"	54-4466	Model 49-1101 (4 Required)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
62	51	300	62-051009001	1468-00005	5W5Q5	MO.5-45	1FM-45	RF Coupling "
63	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	Ext. Ant. Coupling "
64	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	Ext. Ant. Isolation "
65	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	AM Osc. Coupling "
66	220	300	62-122001001	1468-00025	5W5T25	MO.5-325	1FM-325	AM Osc. Grid Cap. "
67	1500	300	62-215001001	1467-0015	1W5D15	MW.5-215	1FM-215	AM Conv. Cath. Byp. "
69	100	300	62-110001001	1468-0001	5W5T1	MO.5-31	1FM-31	AM RF Coupling "
69	10	300	62-010009001	1468-00001	5W5Q1	MO.5-41	MS-41	Fixed Trimmer "

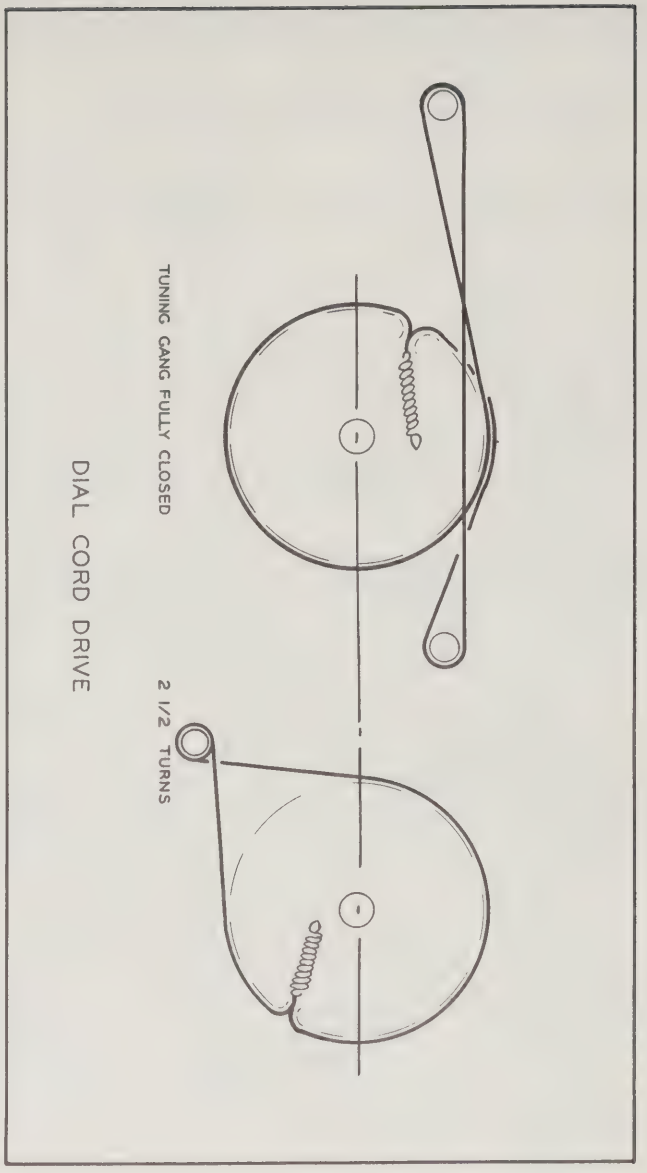
*Parallel sections to obtain desired capacity.
#Omit bypass section.
Note 1-Wind same number of turns around replacement as were on original part.
Note 2-Not used in all models.

CONTROLS

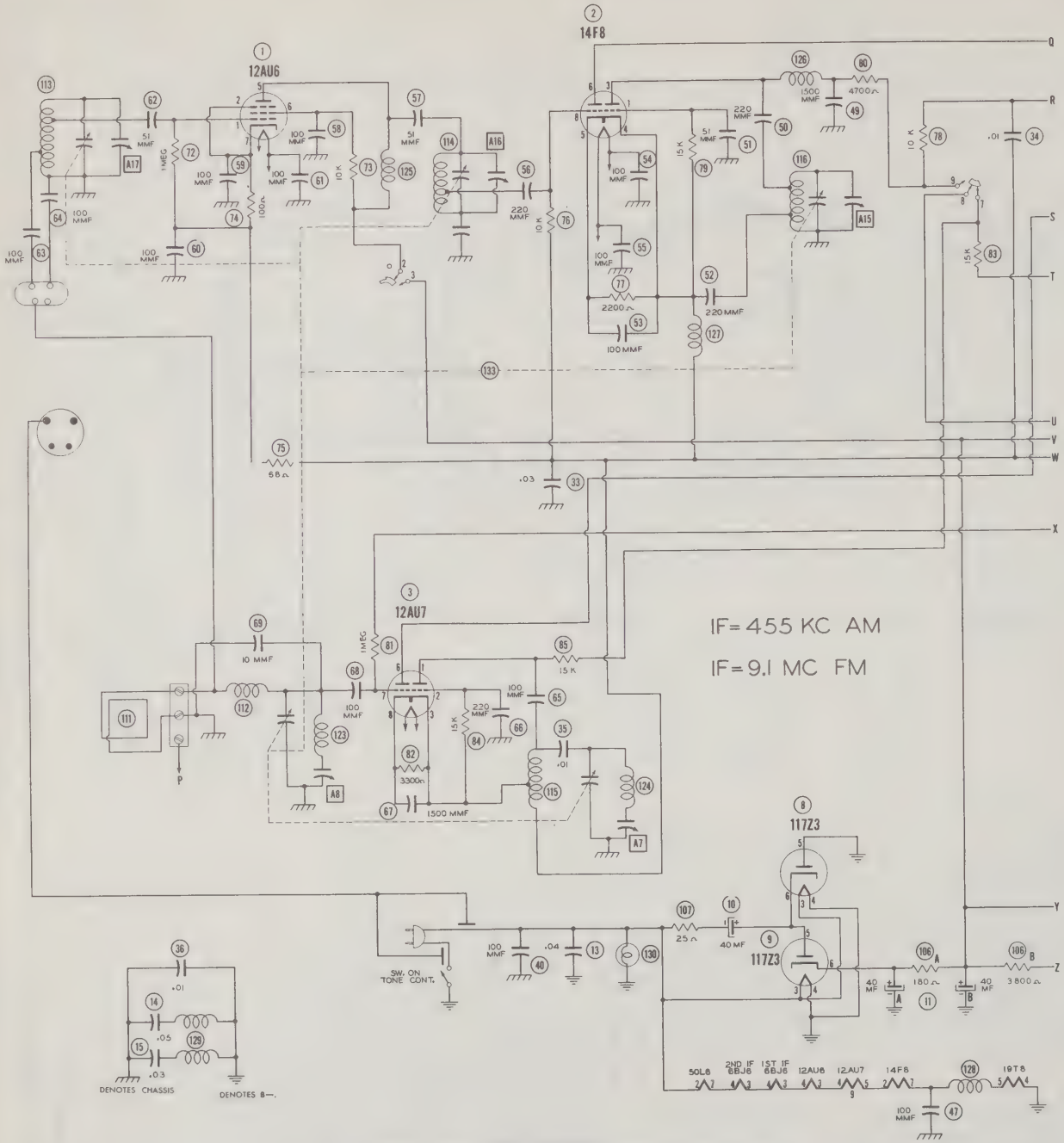
ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	
70A	2 Meg.	½	33-5535-17	D18-139X	T-116	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 70A per instructions
71A	4 Meg.	½	33-5538-34		M-68-Z	Tone Control
B	Shaft		Not Req.		Not Req.	Attach to 71A per instructions
C	Switch		" "		SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
72	1 Meg.	½	66-5103340	BTS-1 Meg.	Br.-Blk.Grn. FM RF Grid
73	10KΩ	½	66-3103340	BTS-10K	Br.-Blk.-Or. FM RF Screen
74	100Ω	½	66-1103340		Br.-Blk.-Br. FM RF Cathode
75	68Ω	½	66-0683340		Blue-Gray-Blk. Parasitic Suppressor
76	10KΩ	½	66-3103340	BTS-10K	Br.-Blk.-Or. FM Conv. Grid
77	2200Ω	½	66-2223340	BTS-2200	Red-Red-Red FM Conv. Cathode
78	10KΩ	½	66-3103340	BTS-10K	Br.-Blk.-Or. FM Conv. Plate Decoup.
79	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. FM Osc. Grid
80	4700Ω	½	66-2473340	BTS-4700	Yl.-Vi.-Red FM Osc. Plate Decoup.
81	1 Meg.	½	66-5103340	BTS-1 Meg.	Br.-Blk.-Grn. AM Conv. Grid
82	3300Ω	½	66-2333340	BTS-3300	Or.-Or.-Red AM Conv. Cathode
83	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. AM Conv. Plate Decoup.
84	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. AM Osc. Grid
85	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. AM Osc. Plate Load
86	68Ω	½	66-0683340		Blue-Gray-Blk. Parasitic Supp.
87	1 Meg.	½	66-5103340	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
88	47Ω	½			Yl.-Vi.-Blk. 1st IF Cathode
89	1000Ω	½	66-2103340	BTS-1000	Br.-Blk.-Red 1st IF Decoup.
90	68Ω	½	66-0683340		Blue-Gray-Blk. Parasitic Suppressor
91	120Ω	½	66-1123340		Br.-Red-Br. 2nd IF Cathode
92	1000Ω	½	66-2103340	BTS-1000	Br.-Blk.-Red 2nd IF Screen
93	2200Ω	½	66-2223340	BTS-2200	Red-Red-Red 2nd IF Plate Decoup.
94	3.3 Meg.	½	66-5333340	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
95	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Or. Diode Filter
96	330KΩ	½	66-4333340	BTS-330K	Or.-Or.-Yl. Diode Load
97	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Or. De-emphasis
98	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Or. Ratio Det. Diode Load
99	100KΩ	½	66-4103340	BTS-100K	Br.-Blk.-Yl. Tone Compensation
100	33KΩ	½	66-3333340	BTS-33K	Or.-Or.-Or. " "
101	10 Meg.	½	66-6103340	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
102	470KΩ	½	66-4473340	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
103	100KΩ	½	66-4103340	BTS-100K	Br.-Blk.-Yl. AF Plate Decoup.
104	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Yl. Output Grid
105	150Ω	½	66-1153340	BW-½-150	Br.-Grn.-Br. Output Cathode
106A	3mfd	10	33-3425-20	AB-4000	Filter
B	180Ω	10		AB-200	"
107	25Ω	2	33-1254-3	AB-25	Surge Limiter



DATE 2/49-#49-17 SET #55 FOLDER #17



STAGE GAIN MEASUREMENTS

CONV. GAIN	7X	600KC	INTER. IF TRANS.	1X	455KC
		455KC	GRID 2nd IF to DIODE	150X	455KC
INPUT IF TRANS.	2X	455KC	AUDIO	30X	400 ∿
1st IF TUBE	70X	455KC	OUTPUT	20X	400 ∿

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

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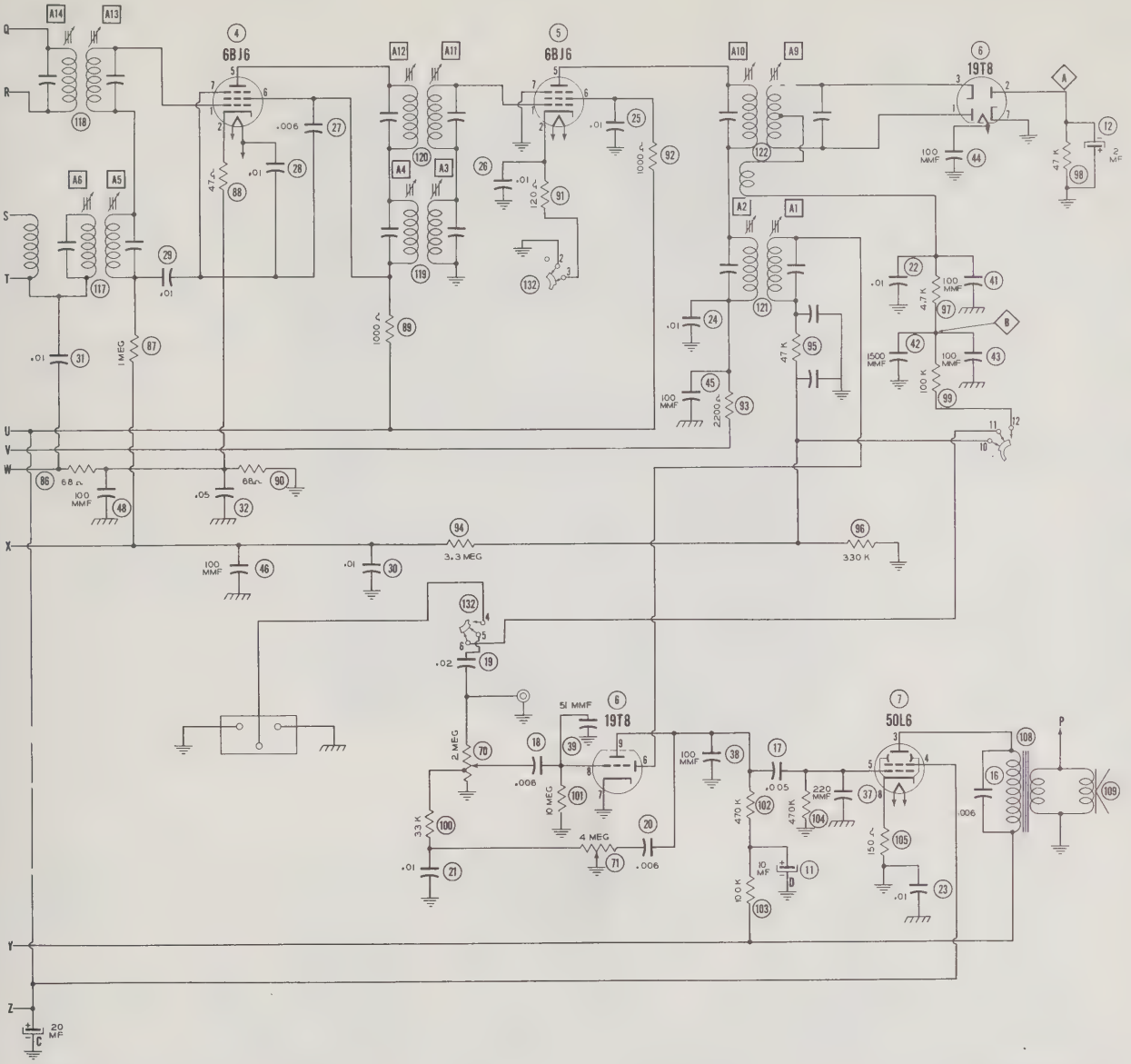
6BJ6
6BJ6
19T8
19T8
50L6
3.3 MEG
330 K
4 MEG
2 MEG
10 MEG
1 MEG
1000 Ω
2200 Ω
68 Ω
68 Ω
47 K
100 K
470 K
470 K
33 K
10.0 K
150 Ω
120 Ω
1000 Ω
.006
.01
.02
.05
.005
.01
.006
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.006
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow receiver and signal generator to warm up for at least fifteen minutes before starting alignment.

AM Alignment should be completed before FM Alignment is attempted.

To set dial pointer turn tuning cap. fully closed and set pointer 3-3/4" from left edge of dial backplate frame. This is the reference mark referred to below.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Use insulated alignment screwdriver for all adjustments.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to terminal #1 of ant. terminal strip. Low side to B-.	455KC	AM	Tuning cap. fully closed (Counter-clockwise)	Across voice coil	A1,A2, A3,A4, A5,A6	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1600KC	"	5-11/16" from reference mark.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A7 for maximum output.
3		"	1500KC	"	Tune for maximum output.	"	A8	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR, VTVM & OUTPUT METER

If VTVM is not available a 20,000Ω per volt DC voltmeter may be used.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	.1 MFD.	High side to Pin 1 (grid) of 6BJ6 1st IF Tube (4). Low side to B-.	9.1MC (400 ∿ Amp. Mod.)	FM (Clock-wise)	Tuning cap. fully closed	DC probe to Point (A). Common to B-.	A9,A10, A11,A12	Adjust for maximum deflection. Attenuate output of sig. gen. to maintain meter reading of 10 volts. After this step do not change any of these adjustment with the exception of A9 in Step 6.
	.1 MFD.	High side to Pin 8 (grid) of 14F8. Low side to B-.	"	"	"	"	A13, A14	Adjust for maximum deflection. Once these adjustments are satisfactory do not change.
						OUTPUT METER		
5	.1 MFD.	High side to Pin 8 (grid) of 14F8. Low side to B-.	9.1MC (400 ∿ Amp. Mod.)	FM (Clock-wise)	Tuning cap. fully closed	DC probe to Point (A). Common to B-.	A9	Adjust for minimum output. This adjustment must be made very carefully as misalignment will result in distortion on FM reception. Continue with FM-RF Alignment, Step 7.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4	.01 MFD	High side to Pin 1 (grid) of 6BJ6 1st IF Tube (4). Low side to B-.	9.1MC (Freq. Mod.)	FM (Clock-wise)	Tuning cap. fully closed	Vertical input to Point (A). Ground to B-.	A10, A11 A12	Disconnect .2 MFD cap.(12) from Point (A). Adjust A8, A9 & A10 for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
5	.01 MFD	High side to Pin 8 (grid) of 14F8. Low side to B-.	"	"	"	"	A13, A14	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Reconnect cap. (12) to Point (A).
6	.01 MFD	"	"	"	"	Vertical input to Point (B). Ground to B-.	A9	Adjust for maximum straightness of cross-over lines with cross-over occurring at center of pattern per Fig. 2.

FM RF ALIGNMENT

Check adjustment of FM-RF Coils with a tuning wand. If insertion of powdered iron end of wand cause an increase in deflection, compress the coil slightly, if insertion of brass end of wand causes an increase in deflection, spread the coil slightly. Correct adjustment is indicated when insertion of either end of wand causes a decrease in deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	300Ω carbon res.	High side to terminal #2 of FM Ant. socket. (Line ant. disconnected). Low side to B-.	105MC (400 ∿ Amplitude Mod.)	FM	4-23/32" from reference mark.	DC probe to Point (A). Common to B-.	A15	Adjust for maximum deflection.
8	"	"	"	"	Tune for maximum deflection.	"	A16, A17	Rock tuning cap. and adjust for maximum deflection.
9	"	"	92MC	"	1-21/32" from reference mark.	"	FM Osc. RF & Ant. Coils (116, 114 & 113)	Adjust per pre-alignment instructions. Repeat Steps 7, 8 & 9 until no further improvement can be made.

FIG. 1

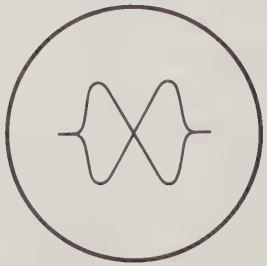
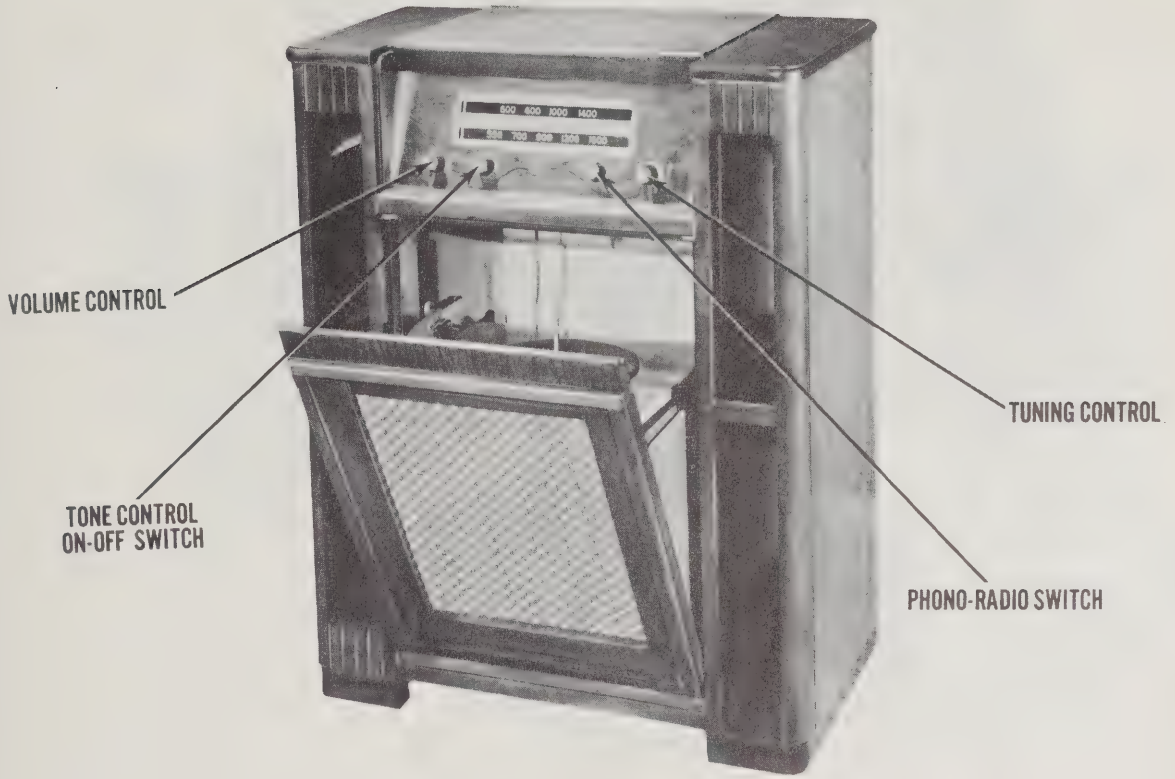


FIG. 2

PHILCO MODELS 49-1602, 49-1603, 49-1604, 49-1605



PHILCO MODELS 49-1602, 49-1603, 49-1604, 49-1605

PHILCO MODEL 49-1602

TRADE NAME	Philco, Models 49-1602, 49-1603, 49-1604, 49-1605
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 14AF7 Converter, 7B7 IF Amp., 7B7 IF Amp., 7C6 Det.-AVC-AF, 35L6GT Power Output, 50X6 Rectifier.
POWER SUPPLY	105-120 Volts AC
TUNING RANGE—BROADCAST	540-1620KC RATING .35 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning cap. fully closed and set dial pointer 2-13/16" from left edge of dial backplate. This is the calibration mark referred to below.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 5 (grid) of 14AF7. Low side side to B-.	455KC	Tuning cap. fully closed	Across voice coil	A1,A2, A3,A4, A5,A6	Adjust for maximum output in order given. If isolation trans. is not used, reduce dummy antenna to .001 MFD to reduce hum modulation.
2		Loop	1600KC	5-13/16" from calibration mark.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1500KC	Tune for maximum output.	"	A8	Adjust for maximum output.

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DATE 2/49-#493-18 SET #55-FOLDER #18

PARTS LIST AND DESCRIPTIONS

PHILCO MODEL 48-1102

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	14AF7	14AF7	8AC	
2	1st IF Amp.	7B7	7B7	8V	
3	2nd IF Amp.	7B7	7B7	8V	
4	Det.-AVC-AF	7C6	7C6	8W	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	50X6	50X6		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	75	25	30-2575-24				D13309	Filter-Orange
B	40	25						" -Red
C	10	250						" -Blue
8	20	150	30-2568-22	AF4F	UP2025	DY-20-150	D13292	Voltage Doubler
9	.05	400	61-0122	484-05	GT4S5	ST-4-05	TC-15	Line Filter
10	.1	400	76-2361	484-.1	GT4P1	ST-4-1	72P2	Line Isolation
11	.05	400		484-05	GT4S5	ST-4-05	TC-15	Phono Line Iso.-Note
12	.006	400	45-3500-7	484-006	GT4D6	ST-6-006	TC-26	Output Plate Bypass
13	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
14	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	" "
15	.006	400	45-3500-7	484-006	GT4D6	ST-6-006	TC-26	" "
16	.004	600	61-0179	684-004	GT6D4	ST-6-004	TC-24	Tone Compensation
17	.006	400	45-3500-7	484-006	GT6D6	ST-6-006	TC-26	" "
18	.25	200	61-0125	484-.25	GT2P25	ST-2-25	TC-2	AF Plate Decoupling
19	.05	400	61-0122	484-05	GT4S5	ST-4-05	TC-15	2nd IF Plate Decoup.
20	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	2nd IF Screen Bypass
21	.05	200	61-0122	484-05	GT2S5	ST-4-05	TC-15	2nd IF Cath. Byp.
22	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	1st IF Screen Byp.
23	.05	200	61-0122	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
24	.01	400	61-0120	484-01	GT4S1	ST-4-01	TC-11	Conv. Plate Decoup.
25	.05	200	61-0122	484-05	GT2S5	ST-4-05	TC-15	Conv. Cathode Bypass
26	.04	400	45-2500-2	484-04	GT6S4	ST-6-04	TC-14	Tuning Cap. Isolation
27	.05	400		484-05	GT4S5	ST-4-05	TC-15	" " " - Note
28	.01	400		484-01	GT4S1	ST-4-01	TC-11	AVC Filter-See Note
29	220	300	62-122001001	1468-0002	5W5T2	MO.5-32	1FM-32	Output Grid Bypass-Cer
30	100	500	60-10105017	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
31	220	300	62-122001001	1468-0002	5W5T2	MO.5-32	1FM-32	Osc. Feedback-Cer.
32	465	500	60-10475307	1469-0005	5R5T5	MOS.5-35	MS-35	RF Coupling
33	5	500	60-90505007	1468-000005	5W5V5	MO.5-55	MS-55	Ext. Ant. Coupling

Note-Not used in all models.

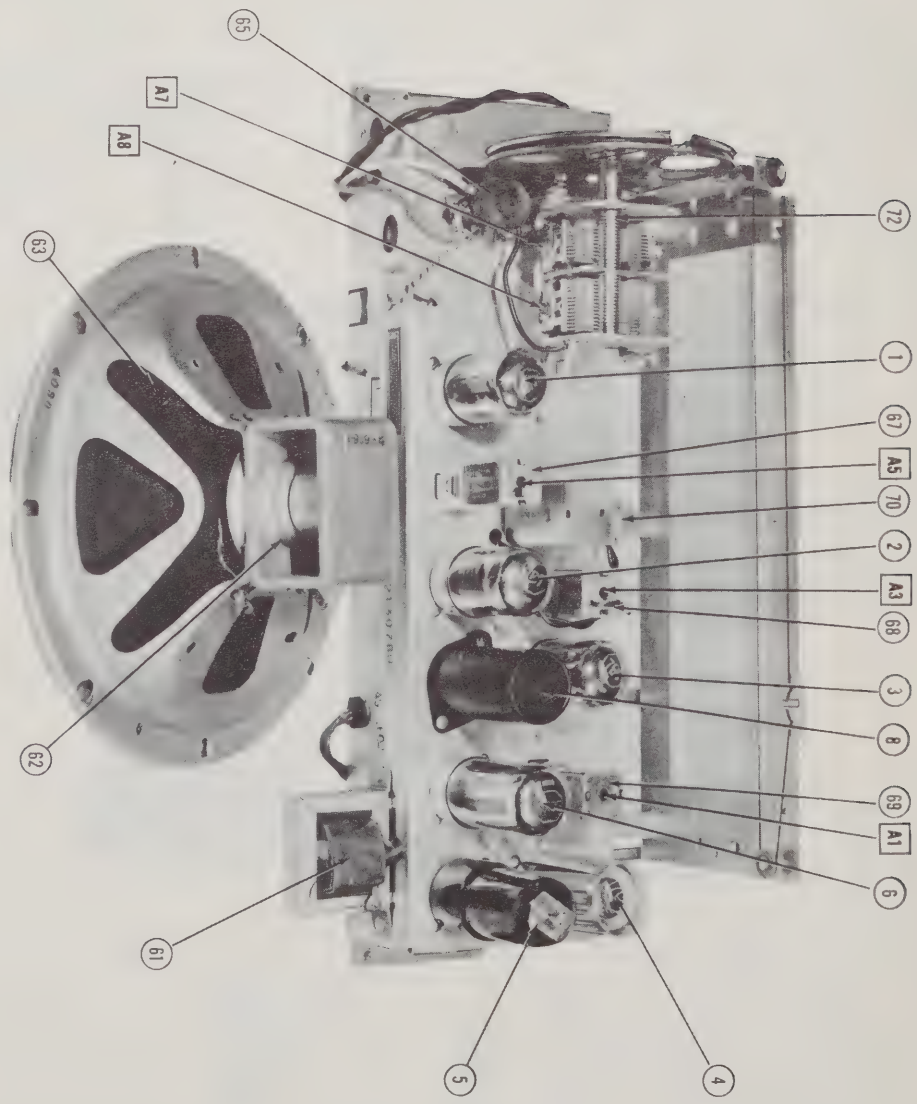
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
34A	2 Meg.	½	33-5535-17	D18-139X	T-116	Volume Control tapped @ 1 Meg.
B	Shaft		Not Req.	A	Not Req.	Attach to 34A per instructions
35A	5 Meg.	½	33-5538-38			Tone Control
B	Shaft		Not Req.			Attach to 35A per instructions
C	Switch		" "			" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
36	150K Ω	½	66-4153340	BTS-150K	Br.-Grn.-Yl. Ext. Ant. Loading
37	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Or. Osc. Grid
38	220KΩ	½	66-4223340	BTS-220K	Red-Red-Yl. Osc. Plate
39	3900Ω	½	66-2393340	BTS-3900	Or.-White-Red Conv. Cathode
40	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	Red-Red-Grn. Conv. Grid
41	10KΩ	½	66-3103340	BTS-10K	Br.-Blk.-Or. Conv. Plate Decoup.
42	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
43	100Ω	½	66-1103340	BW-½-100	Br.-Blk.-Br. 1st IF Cathode
44	1000Ω	½	66-2103340	BTS-1000	Br.-Blk.-Red 1st IF Screen
45	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
46	270Ω	½	66-1273340	BW-½-270	Red-Vi.-Br. 2nd IF Cathode
47	1000Ω	½	66-2103340	BTS-1000	Br.-Blk.-Red 2nd IF Screen
48	8200Ω	½	66-2823340	BTS-8200	Gray-Red-Red 2nd IF Plate Decoup.
49	47KΩ	½	66-3473340	BTS-47K	Yl.-Vi.-Or. Diode Filter
50	470KΩ	½	66-4473340	BTS-470K	Yl.-Vi.-Yl. Diode Load
51	68KΩ	½	66-3683340	BTS-68K	Blue-Gray-Or. Tone Compensation
52	10 Meg.	½	66-6103340	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
53	100KΩ	½	66-4103340	BTS-100K	Br.-Blk.-Yl. AF Plate Load
54	220KΩ	½	66-4223340	BTS-220K	Red-Red-Yl. AF Plate Decoup.
55	470KΩ	½	66-4473340	BTS-470K	Yl.-Vi.-Yl. Output Grid
56	130Ω	½	66-1133340	BW-½-150	Br.-Or.-Br. Output Cathode
57	8200Ω	2	66-2855360	BT-2-8200	Gray-Red-Red Filter
58	500Ω	5	33-3435-3	AB-500	"
59	25Ω	3	33-1334-5		Red-Grn.-Blk. Surge Limiter
60	150KΩ	½	66-4153340	BTS-150K	Br.-Grn.-Yl. Line Isolation

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
61	4400Ω	3.4Ω	450Ω	.7Ω	32-8242-3	A-3877#	T22S46#	A-2902#	#Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-115		
62	PM	3.4Ω	36-1626-1	Mod. P8-V	8A31	
	CONE DIA.	VC DIA.				
63	7-5/16"	3/4"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
64	Loop Ant.		0Ω	32-4313		
65	Ant. Coil		1Ω	32-4033-9		
66	Osc. Coil		6.8Ω	32-4153	14-1060	*Tertiary Winding 17Ω
67	1st IF	7.5Ω	17Ω*	32-4258		
68	2nd IF	10Ω	10Ω	32-4160-3		
69	3rd IF	12.6Ω	13Ω	32-4240-2	16-6670	

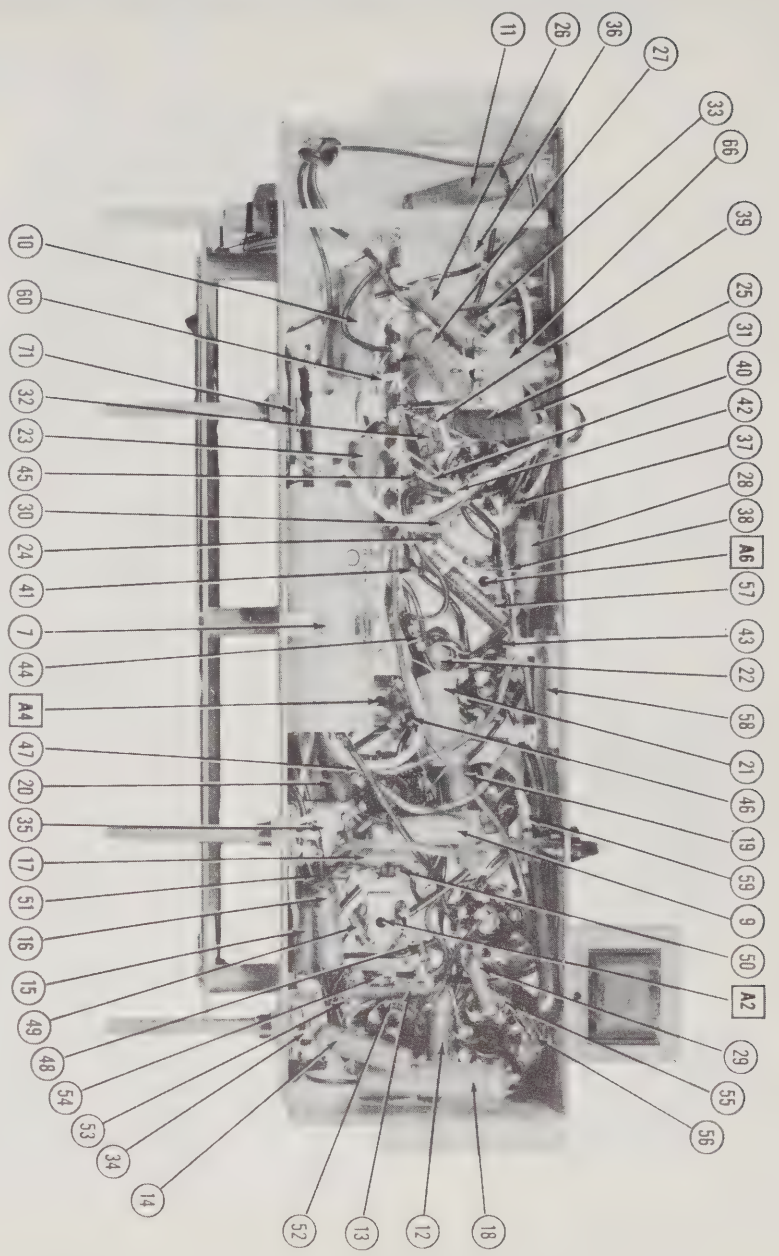
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					PHILCO PART No.		
70	Screw	110			34-2605		6 W.

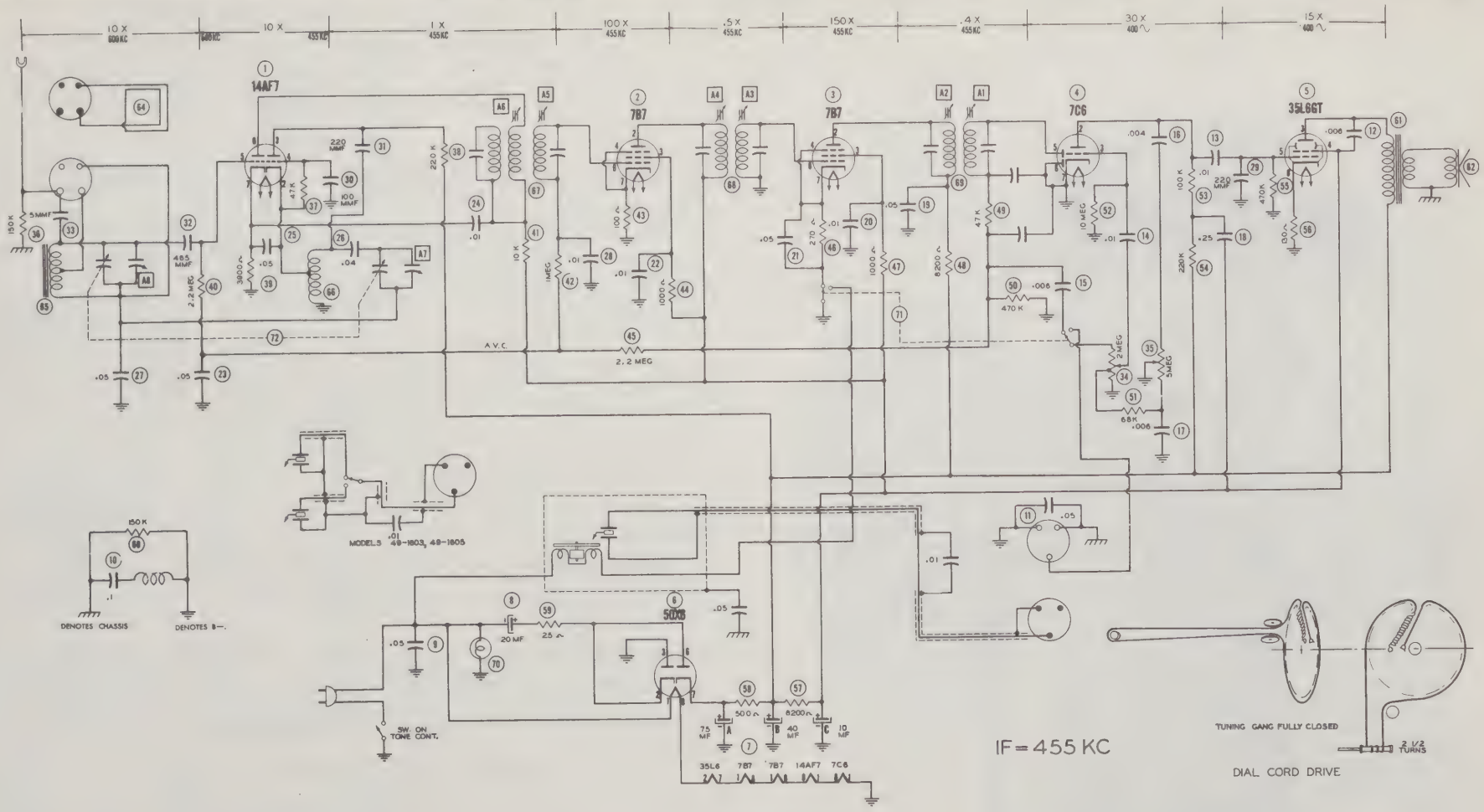
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
71	Switch	45-1745-1	Radio-Phono
72	2 Gang Var. Cap.	81-2727-3	(17-484MMF, 16-164MMF)
	Knob	54-4486	4 Required
	Dial Pointer	56-5630-CP	

CHASSIS—BOTTOM VIEW



PHILCO MODEL 49-1602



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14AF7	6.7VAC	0V.	20VDC	-3.4VDC§	0V.	75VDC	5VDC	20VAC
2	7B7	27VAC	90VDC	90VDC	0V.	0V.	0V.	1.1VDC	20VAC
3	7B7	33VAC	110VDC	90VDC	0V.	0V.	0V.	2.4VDC	27VAC
4	7C6	0V.	110VDC	-.6VDC	0V.	-.4VDC	0V.	0V.	6.7VAC
5	35L6GT	0V.	65VAC	200VDC	90VDC	0V.	0V.	33VAC	4.5VDC
6	5Y3GT	117VAC	120VDC	0V.	0V.	215VDC	120VDC	240VDC	65VAC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RADIO-PHONO SWITCH IN RADIO POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14AF7	7Ω	2Ω	310KΩ	47KΩ	4.9 Meg.	110KΩ	3.9KΩ	10Ω
2	7B7	25Ω	100KΩ	100KΩ	0Ω	0Ω	3.7 Meg.	100Ω	18Ω
3	7B7	30Ω	100KΩ	100KΩ	0Ω	10Ω	10Ω	270Ω	25Ω
4	7C6	0Ω	410KΩ	10 Meg.	0Ω	520KΩ	0Ω	0Ω	7Ω
5	35L6GT	INF.	52Ω	90KΩ	100KΩ	470KΩ	0Ω	30Ω	130Ω
6	5Y3GT	85Ω	180KΩ	0Ω	0Ω	90KΩ	180KΩ	90KΩ	52Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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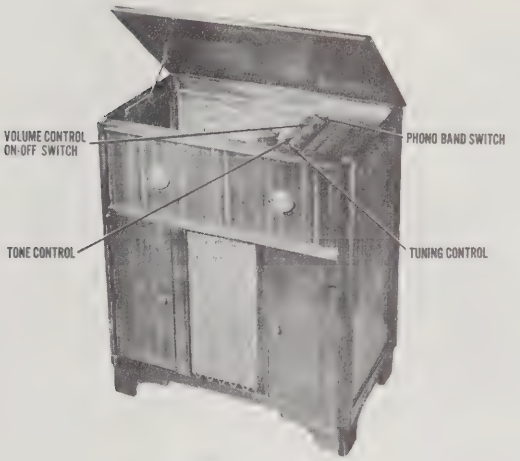
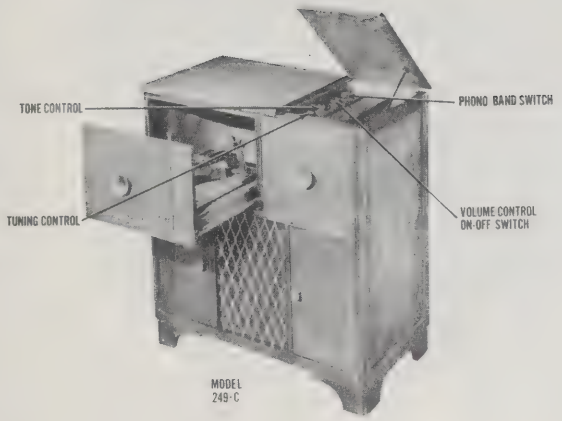
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



MODEL
149 C



MODEL
249-C

PHILHARMONIC MODELS
149-C, 249-C

PHILHARMONIC MODELS
149-C, 249-C

PHILHARMONIC MODEL 149-C

TRADE NAME	Philharmonic, Models 149-C, 249-C
MANUFACTURER	Philharmonic Radio Corp., 1714 S. State St., Chicago 16, Ill.
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (SEVEN)	Types, 6SA7 Converter, 6SF7 IF Amp.-Det.-AVC, 6SL7GT Phase Inv., (2) 25L6GT Power Output, (2) 25Z6GT Rectifier.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1700KC RATING .47 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning cap. fully closed and set dial pointer 1-23/32" from left edge of plastic dial backplate. This is the calibration mark referred to below.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and chassis.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to Pin 8 (grid) of 6SA7. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1600KC	7-7/16" from calibration mark.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILHARMONIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter		6SA7	6SA7	8R	
2	IF Amp.-Det.-AVC		6SF7	6SF7	7AZ	
3	Phase Inverter		6SL7GT	6SL7GT	8BD	
4	Power Output		25L6GT	25L6GT	7AC	
5	" "		25L6GT	25L6GT	7AC	
6	Rectifier		25Z6GT	25Z6GT	7Q	
7	"		25Z6GT	25Z6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILHARMONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
8A	40	150		PRSA150/40-40	EDL4415	DSR-2x40-150	TA-440	Filter-Blue
B	40	150		PRSA150/40-20	EDL4215	DSB-301*	TA-240	" -Red
C	40	150						" -Yellow
D	10	150						" -Green
9	.05	400		484-05	GT4S5	ST-4-05	TC-15	Line Filter
10	.02	400		484-02	GT4S2	ST-4-02	TC-12	Audio Coupling
11	.005	600		684-005	GT6D5	ST-6-005	TC-25	Tone Compensation
12	.1	400		484-1	GT4P1	ST-4-1	TC-1	Phono Isolation
13	.05	600		684-05	GT6S5	ST-6-05	TC-15	AVC Filter
14	.2	400		484-2	GT4P2	ST-4-2	6SP22	RF Bypass Power Supply
15	.002	600		684-002	GT6D2	ST-6-002	TC-22	Ext. Ant. Isolation
16	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	Audio Coupling
17	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	" "
18	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	Feedback
19	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	RF Diode Filter
20	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	" " "
21	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Couplin

*Omit bypass section

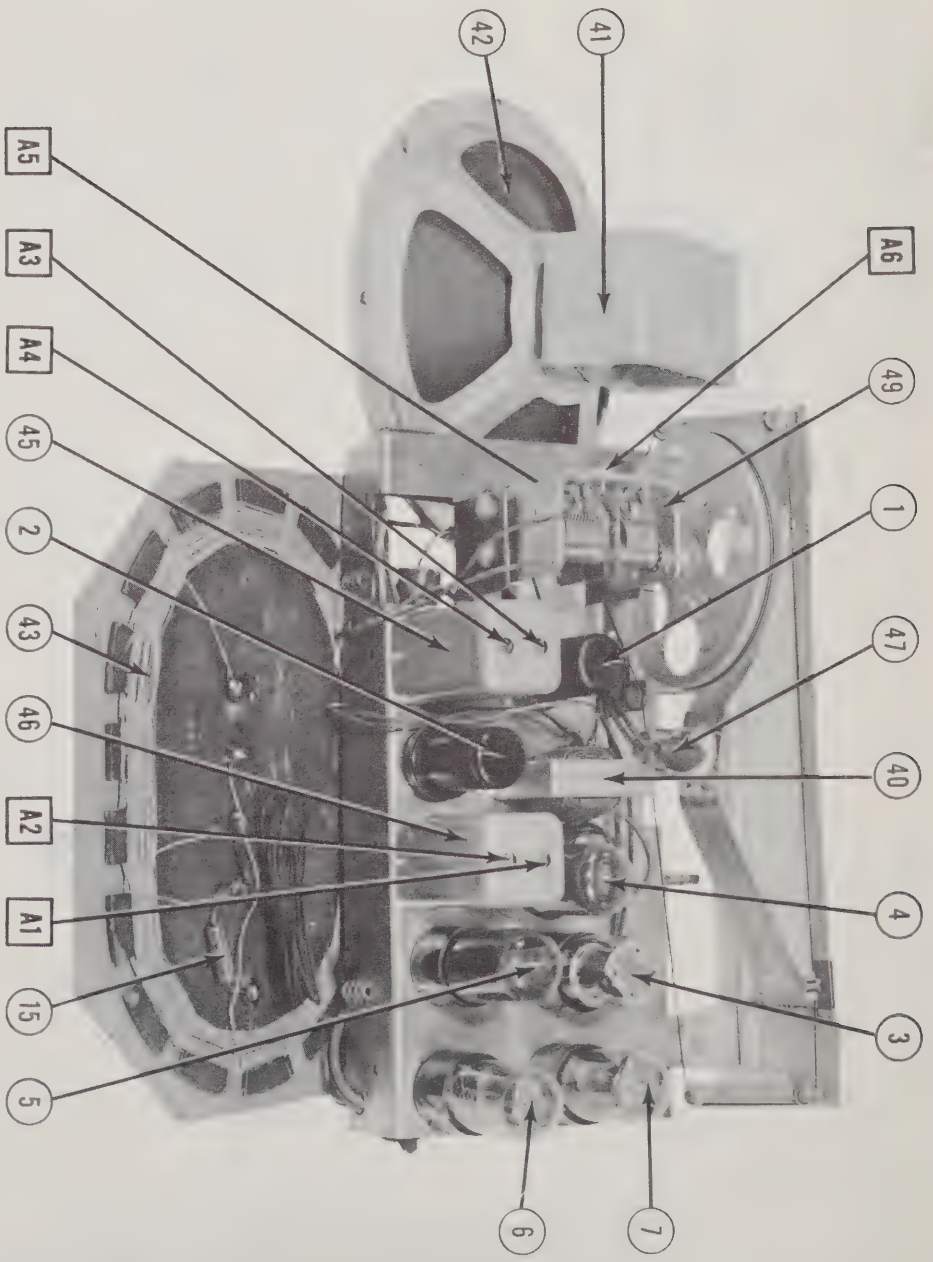
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILHARMONIC PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	500KΩ	½		D13-133	M-60-Z	Volume Control
B	Shaft			A	Not Req.	Attach to 22A per instructions
C	Switch			41	SW-A	" " " " "
23A	560KΩ	½		D13-133	M-60-Z	Tone Control
B	Shaft			A	Not Req.	Attach to 23A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILHARMONIC PART No.	IRC PART No.	IDENTIFICATION CODES
24	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
25	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
26	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Diode Filter
27	33Ω	½		BW-½-33	Or.-Or.-Blk. Feedback
28	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Grid
29	100KΩ	½		BTS-100K	Br.-Blk.-Yl. AF Plate Load
30	2200Ω	½		BTS-2200	Red-Red-Red AF Cathode
31	18KΩ	½		BTS-18K	Br.-Gray-Or. Phase Inverter Grid
32	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inverter Plate Load
33	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
34	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "
35	82Ω	1		BW-1-82	Gray-Red-Blk. Output Cathode
36	100Ω	½		BW-½-100	Br.-Blk.-Br. Feedback
37	1500Ω	½		BTS-1500	Br.-Grn.-Red Filter
38	1500Ω	2		PT-2-1500	Br.-Grn.-Red "
39	10Ω	5		AB-10	Pilot Light Shunt

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILHARMONIC PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
40	5500Ω CT	3.5Ω	240Ω CT	.4Ω	S-TA116	A-3823	T22887	A-2901	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILHARMONIC PART No.	JENSEN PART No.	QUAM PART No.	
41	FIELD PM	VC IMP. 3.5Ω	4489	ST-117 Mod. P8-T	8A31	
42	CONE DIA. 7½"	VC DIA. 1"				

R F COILS

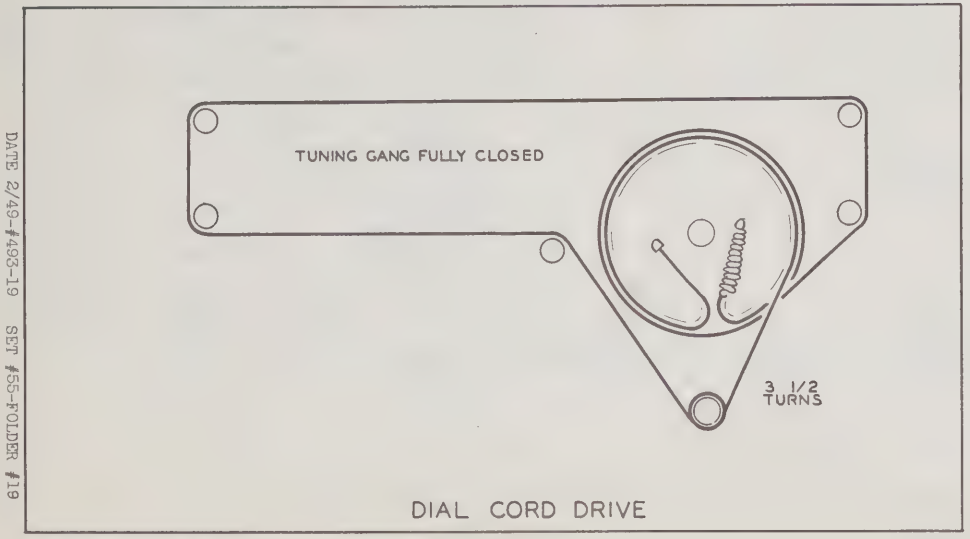
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILHARMONIC PART No.	MEISSNER PART No.	
43	Loop Ant.	0Ω	1Ω			
44	Osc. Coil		5Ω		14-1040	
45	Input IF	14Ω	13.5Ω		16-6658	
46	Output IF	5Ω	12Ω		16-6658	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					PHILHARMONIC PART No.		
47	Bayonet	6-8	0.25	Blue			Type 44

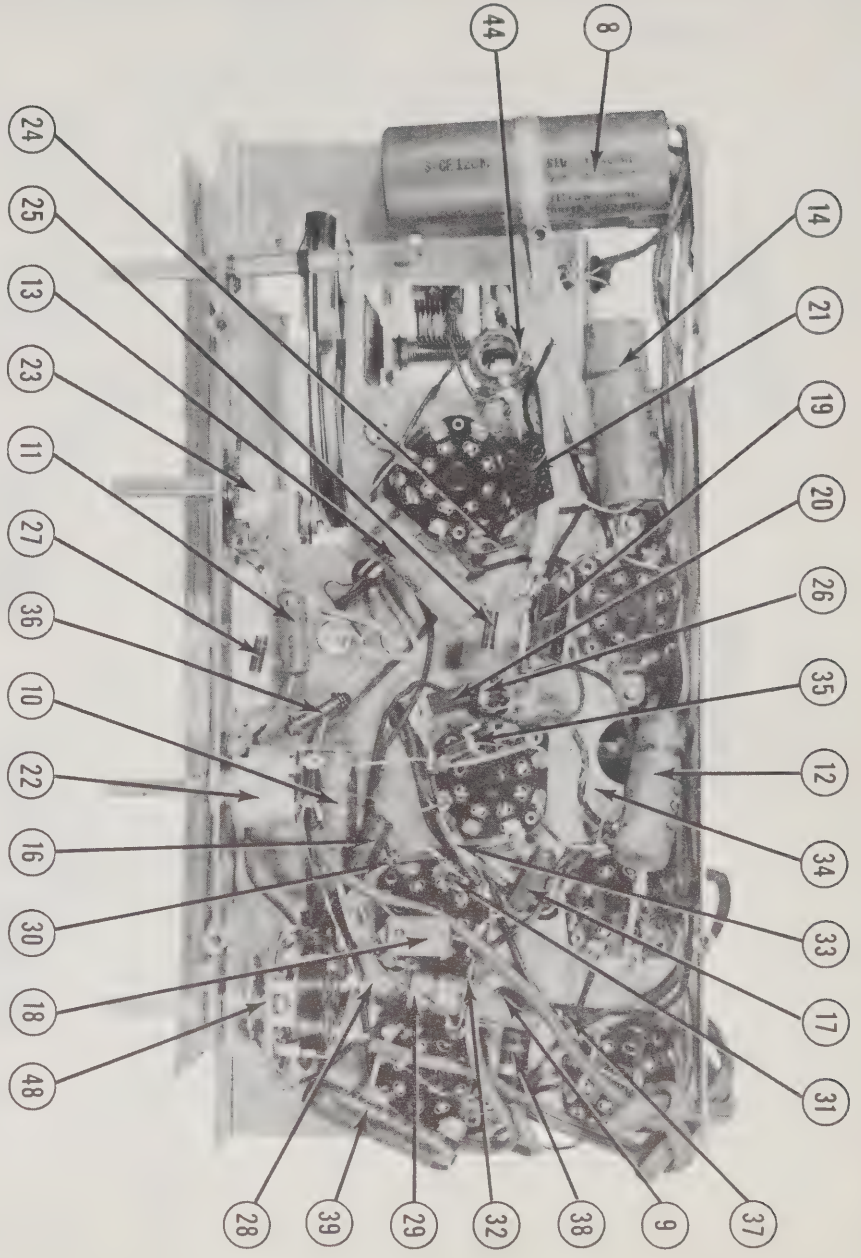
MISCELLANEOUS

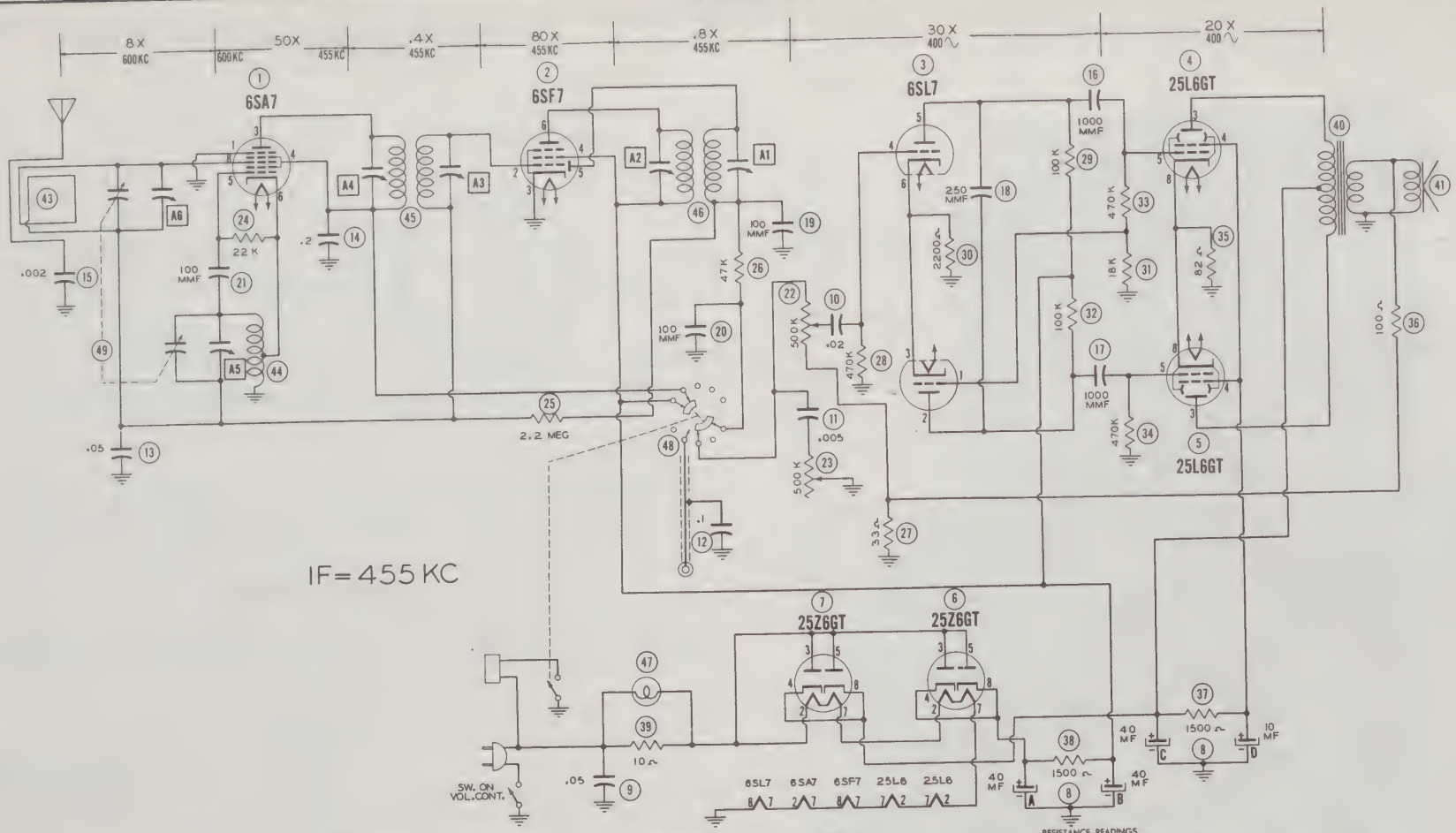
ITEM No.	PART NAME	PHILHARMONIC PART No.	NOTES
48	Switch		Radio-Phono
49	2 Gang Var. Cap.		(30-472MMF, 32-195MMF)



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0V.	5.6VAC	100VDC	100VDC	-9.3VDC	0V.	10VAC	-.8VDC
2	6SF7	0V.	-.4VDC	0V.	100VDC	-.4VDC	108VDC	18VAC	10VAC
3	6SL7GT	0V.	68VDC	1.2VDC	0V.	70VDC	1.2VDC	5.6VAC	0V.
4	25L6GT	0V.	47VAC	118VDC	110VDC	0V.	0V.	18VAC	7.6VDC
5	25L6GT	0V.	68VAC	118VDC	110VDC	0V.	0V	47VAC	7.6VAC
6	25Z6GT	0V.	90VAC	113VAC	123VDC	113VAC	0V.	65VAC	123VDC
7	25Z6GT	117VAC	113VAC	113VAC	140VDC	113VAC	98VDC	90VAC	140VDC

TAKEN WITH VACUUM TUBE VOLTMETER.
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

RADIO-PHONO SWITCH IN RADIO POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0Ω	3Ω	90KΩ	90KΩ	22KΩ	1Ω	0Ω	2.7 Meg.
2	6SF7	0Ω	2.7 Meg.	0Ω	80KΩ	580KΩ	80KΩ	13Ω	0Ω
3	6SL7GT	18KΩ	180KΩ	2.2KΩ	470KΩ	180KΩ	2.2KΩ	3Ω	0Ω
4	25L6GT	0Ω	30Ω	70KΩ	70KΩ	470KΩ	0Ω	13Ω	82Ω
5	25L6GT	INF.	47Ω	70KΩ	70KΩ	90KΩ	0Ω	30Ω	82Ω
6	25Z6GT	INF.	60Ω	70Ω	80KΩ	70Ω	INF.	47Ω	80KΩ
7	25Z6GT	72Ω	70Ω	70Ω	70KΩ	70Ω	80KΩ	60Ω	70KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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493-19

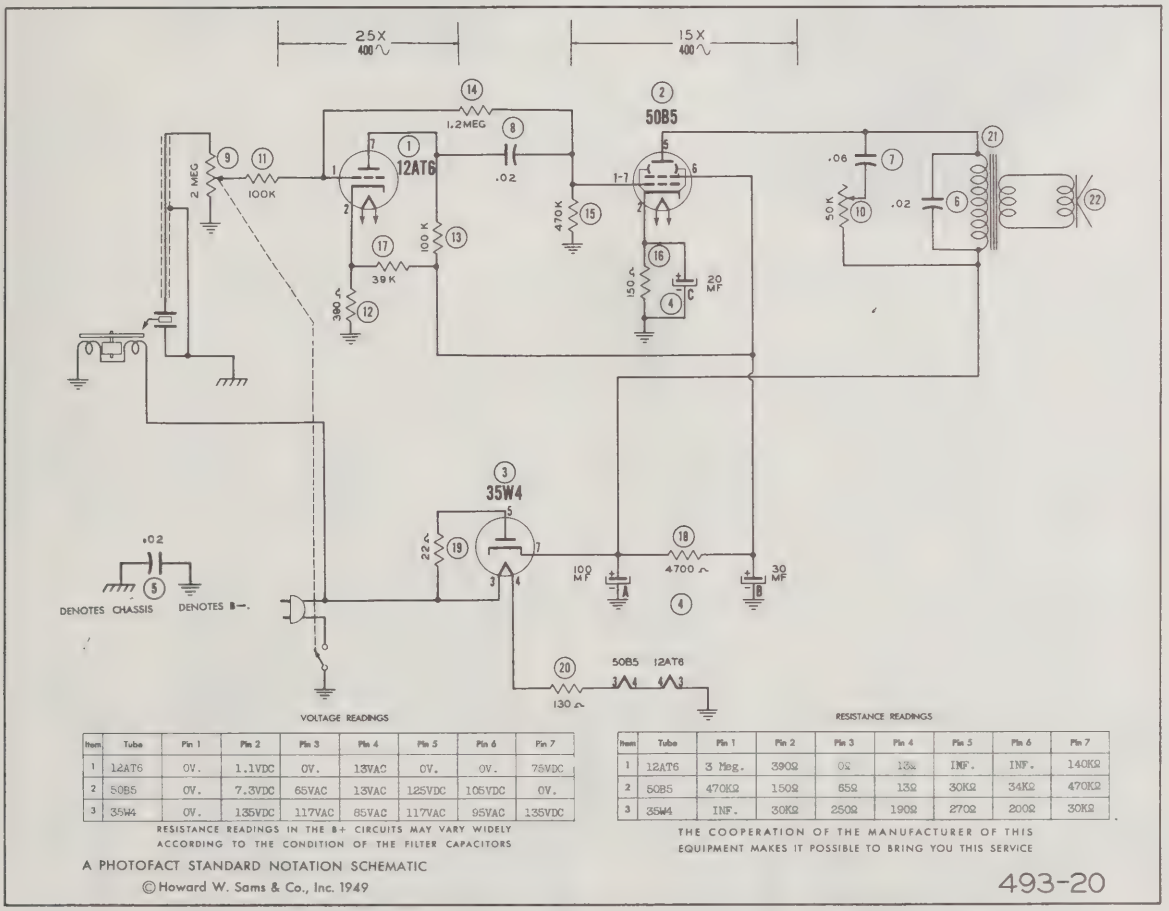
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MODEL K-263 MODEL K-202

PHONOLA MODEL K-202

TRADE NAME	Phonola, Models K-202, K-263
MANUFACTURER	Waters Conley Co., Rochester, Minn.
TYPE SET	AC Operated Phono Player with 3 Tube Amplifier
TUBES (THREE)	Types, 12AT6 or 12AV6 AF Amp., 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC RATING .23 Amp. @ 117 Volts AC



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12AT6	0V.	1.1VDC	0V.	13VAC	0V.	0V.	75VDC
2	50B5	0V.	7.3VDC	65VAC	13VAC	125VDC	105VDC	0V.
3	35W4	0V.	135VDC	117VAC	85VAC	117VAC	95VAC	135VDC

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12AT6	3 Meg.	390Ω	0Ω	13Ω	INF.	INF.	140KΩ
2	50B5	470KΩ	150Ω	65Ω	13Ω	30KΩ	34KΩ	470KΩ
3	35W4	INF.	30KΩ	250Ω	190Ω	270Ω	200Ω	30KΩ

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493-20

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHONOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1A	AF Amp.	12AT6	12AT6	7BT	
B	AF Amp.	12AV6	12AV6	7BT	
2	Power Output	50B5	50B5	7BZ	
3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
4A	100	150	8396	PRSA5050-2*	EZ555150*	DSB-304*	D12878	Filter-Blue
B	30	150		PRS150/30		M-30-150		" -Red
C	20	25						Cathode Bypass-Yellow
5	.02	400	8399	484-02	GT4S2	ST-4-02	TC-12	Isolation
6	.02	400	8399	484-02	GT4S2	ST-4-02	TC-12	Output Plate Bypass
7	.06	400	8398	484-06	GT4S5	ST-6-06	TC-16	Tone Compensation
8	.02	400	8399	484-02	GT4S2	ST-4-02	TC-12	Audio Coupling

*Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
9A	2 Meg.	½	8834	D13-139	M-66-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 9A per instructions
C	Switch		" "	41	SW-A	" " " " "
10A	50KΩ	½	8407	D13-123	M-46-Z	Tone Control
B	Shaft		Not Req.	A	Not Req.	Attach to 10A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	IDENTIFICATION CODES
11	100KΩ	1/3	9892	BTS-100K	Br.-Blk.-Yl. Tone Compensation
12	390Ω	1/3	9894	BW-½-390	Or.-White-Br. AF Cathode
13	100KΩ	1/3	9892	BTS-100K	Br.-Blk.-Yl. AF Plate Load
14	1.2 Meg.	1/3	9893	BTS-1.2 Meg.	Br.-Red-Grn. Feedback
15	470KΩ	1/3	9896	BTS-470K	Yl.-Vi.-Yl. Output Grid
16	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
17	39KΩ	1/3	9895	BTS-39K	Or.-White-Or. AF Cathode Bias
18	4700Ω	1	8403	BTA-4700	Yl.-Vi.-Red Filter
19	22Ω	½	8432	BW-½-22	Red-Red-Blk. Rectifier Ballast
20	130Ω	4	9891	ABA-150	Line Dropping-See Note

Note-On IRC replacement set slider at 130Ω from one end.

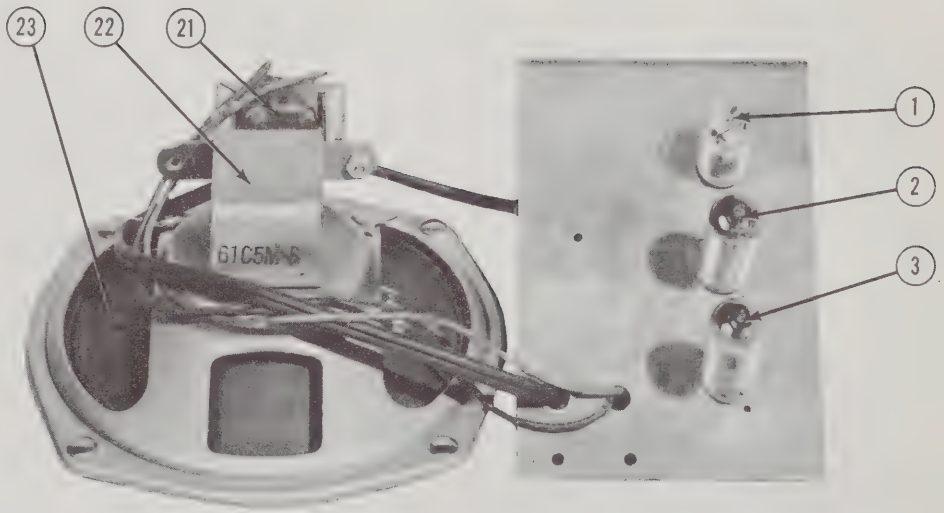
TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHONOLA PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	INSTALLATION NOTES
21	1870Ω	3.0Ω	184Ω	.4Ω	9890	A-3876	T22S45	A-2928	

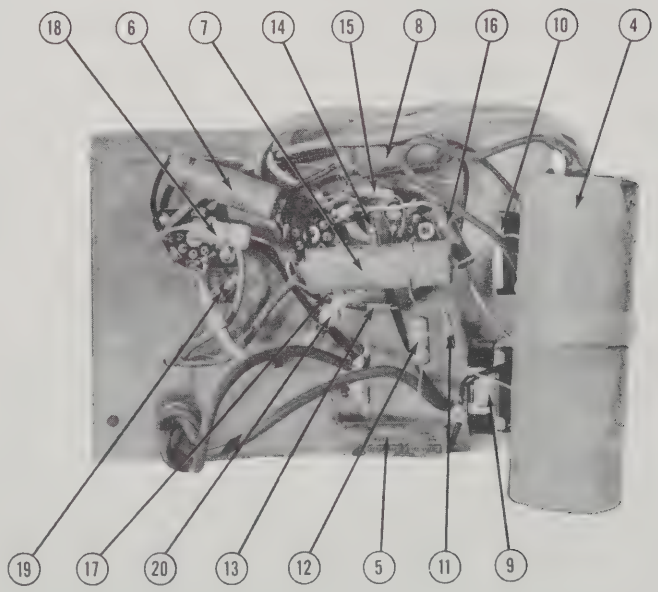
SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: VC IMP.	REPLACEMENT DATA: PHONOLA PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
22	PM	3.0Ω	8788	ST-108 Mod. P6-X	6A15	
23	CONE DIA. 5-7/8"	VC DIA. 9/16"				

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



STROMBERG-CARLSON MODEL 1202 (SERIES 10)

FIG. 1

STROMBERG-CARLSON MODEL 1202

TRADE NAME	Stromberg-Carlson, Model 1202 (Series 10)
MANUFACTURER	Stromberg-Carlson Co., 100 Carlson Rd., Rochester 3, N.Y.
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 6AQ6 Det.-AVC-AF, 50L6GT Power Output.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1640KC RATING .26 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.
Use no more signal than is necessary to obtain a satisfactory meter reading.
Use an insulated alignment screwdriver for adjusting.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use -3 volt DC range on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.01 MFD	High side to Pin 7 (grid) of 6BE6 tube. Low side to B-.	455KC	Tuning cap. fully closed	DC probe to Point (A). Common to B-.	A1,A2, A3,A4.	Adjust for maximum deflection.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 15KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
2	.01 MFD	High side to Pin 7 (grid) of 6BE6 Tube. Low side to B-.	455KC (freq. mod.)	Tuning cap. fully closed	Vertical input to Point (B). Ground to B-.	A1,A2, A3,A4	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.

RF ALIGNMENT

Use -3 volt DC range on VTVM.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3	.01 MFD	High side to ext. ant. term. Low side to B-.	1650KC	Tuning cap. fully open.	DC probe to Point (A). Common to B-.	A5	Adjust for maximum deflection
4	.01 MFD	"	1400KC	Tune for maximum deflection.	"	A6,A7	" " " "

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DATE 2/49-#493-21 SET #55-FOLDER #21

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STROMBERG-CARLSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12BA6	12BA6	7BK	
2	Converter	12BE6	12BE6	7CH	
3	IF Amp.	12BA6	12BA6	7BK	
4	Det.-AVC-AF	6AQ6	6AQ6	7BT	
5	Power Output	50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STROMBERG-CAR. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	200	111032	AF88J	UP6BJ35	DY-2x40-450*	EL-245	■ Filter
B	40	200						▲ "
7	.05	400	40632	484-05	GT4S5	ST-4-05	TC-15	Line Filter
8	.05	400	40632	484-05	GT4S5	ST-4-05	72P1	Line Isolation
9	.01	600	40632	684-01	GT6S1	ST-6-01	TC-11	Output Plate Bypass
10	.005	600	27760	684-005	GT6D5	ST-6-005	TC-25	Audio Coupling
11	.005	600	110419	684-005	GT6D5	ST-6-005	TC-25	" "
12	.005	600	110419	684-005	GT6D5	ST-6-005	TC-25	Tone Compensation
13	.01	500	110420	684-01	GT6S1	ST-6-01	TC-11	Phono Isolation
14	.05	400	40632	484-05	GT4S5	ST-4-05	TC-15	AVC Filter
15	.05	400	40632	484-05	GT4S5	ST-4-05	TC-15	Decoupling-See Note
16	1000	300	110425	1468-001	1W5D1	MW.5-21	1FM-21	AF Plate Bypass-Cer.
17	250	500	25376	1468-00025	5W5T25	MO.5-325	1FM-325	Phono Tone Comp.
18	470	500	110209	1468-0005	5W5T5	MO.5-35	1FM-35	" " "
19A	100	300	*	1468-0001	5W5T1	MO.5-31	1FM-31	RF Diode Filter-Cer.
B	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	" " " "
20	47	300	110458	1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.-Cer.

*Items 19A, 19B and 25 are combined into one unit obtainable under manufacturers part #110478.
Note-Not used in all models.

CONTROLS

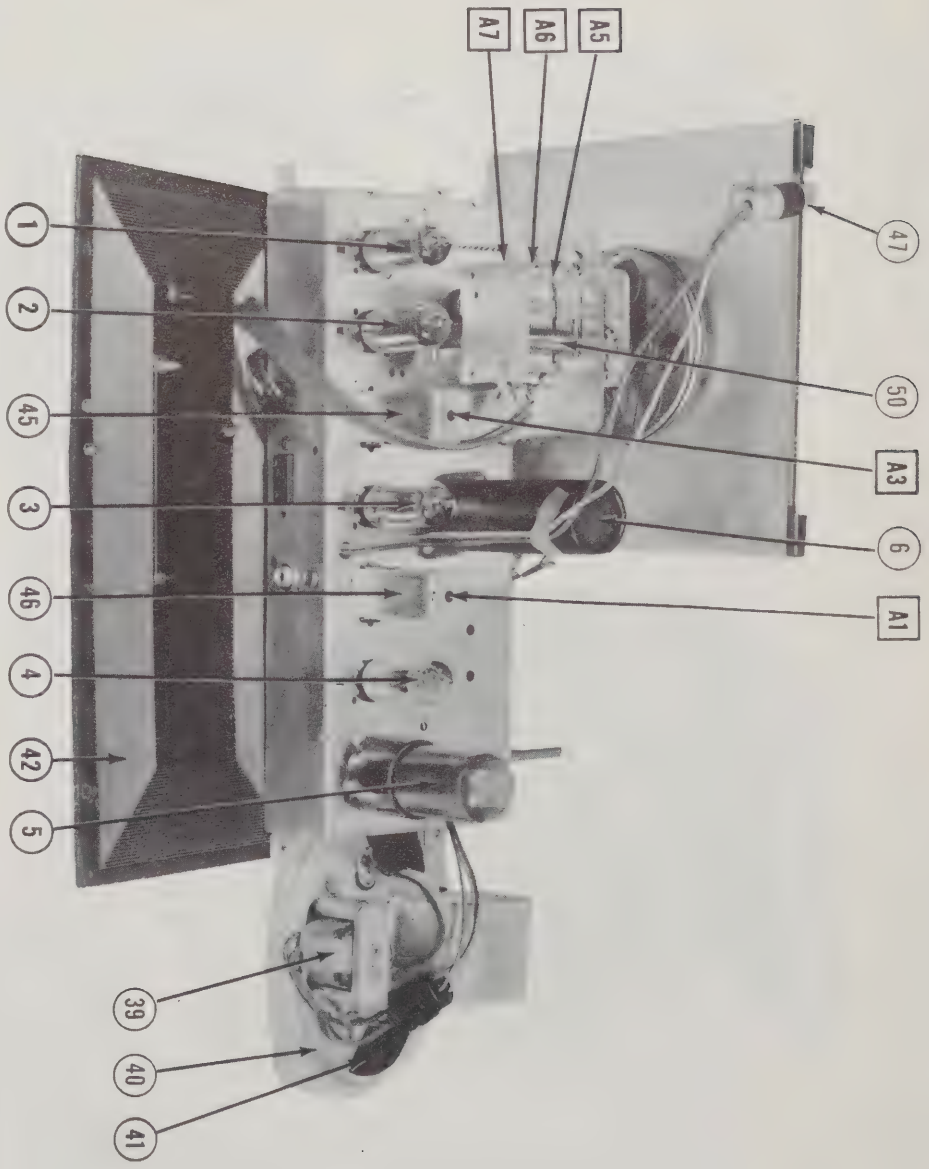
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STROMBERG. PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21A	1 Meg.	½	145032	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 21A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STROMBERG-CARLSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
22	22KΩ	½	149109	BTS-22K	Red-Red-Or. Osc. Grid
23	10 Meg.	½	149125	BTS-10 Meg.	Br.-Blk.-Blue Osc. Grid-See Note 1
24	2.2 Meg.	½	149121	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
25	47KΩ	½	*	BTS-47K	Diode Filter
26	2.2 Meg.	½	149121	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
27	10 Meg.	½	149125	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
28	330KΩ	½	149116	BTS-370K	Or.-Or.-Yl. AF Plate Load
29	470KΩ	½	149117	BTS-470K	Yl.-Vi.-Yl. Output Grid
30	150Ω	½	149168	BW-½-150	Br.-Grn.-Br. Output Cathode
31	1800Ω	2	149047	BT-2-1800	Br.-Gray-Red Filter
32	27Ω	2	149244		Red-Vi.-Blk. Surge Limiter
33	39Ω	2	149030	BW-2-39	Or.-White-Blk. Line Dropping
34	120Ω	2	149035	BW-2-120	Br.-Red-Br. Pilot Light Shunt
35			149243		Line Dropping-See Note 2
36	270KΩ	½	28184	BTS-270K	Red-Vi.-Yl. Phono Tone Comp.
37	220KΩ	½	149115	BTS-220K	Red-Red-Yl. Line Isolation
38	220Ω	½	149097	BW-½-220	Red-Red-Br. Decoupling-See Note 1

*Items 25, 19A & B are combined into one unit obtainable under Mfgr's. Part #110478.
Note 1-Not used in all models.
Note 2-Special negative temperature co-efficient res. Order from original manufacturer.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		STROMBERG-CARLSON PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
39	1650Ω	3.5Ω	168Ω tapped @ 33Ω	.6Ω	161413	A-3330		A-3031	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			STROMBERG-CARLSON PART No.	JENSEN PART No.	QUAM PART No.	
40	FIELD	VC IMP.	155029	ST-109	52A21	
	PM	3.5Ω		Mod. P6-W		
41	CONE DIA.	VC DIA.				
	5-3/8"	9/16"				

R F COILS

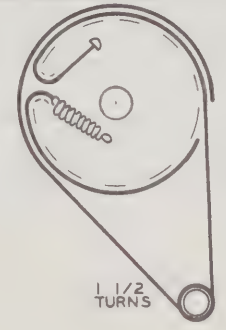
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	STROMBERG-CARLSON PART No.	MEISSNER PART No.	
42	Loop Ant.		1.8Ω	139022		
43	RF Coil	1Ω	8Ω	114046		
44	Osc. Coil	.5Ω	6.5Ω	114047	14-1060	
45	Input IF	18Ω	20Ω	114336	16-6678	
46	Output IF	14Ω	13.5Ω	114337	16-6678	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					STROMBERG-CARLSON PART No.		
47	Bayonet	6-8	0.15	Brown			Type #47

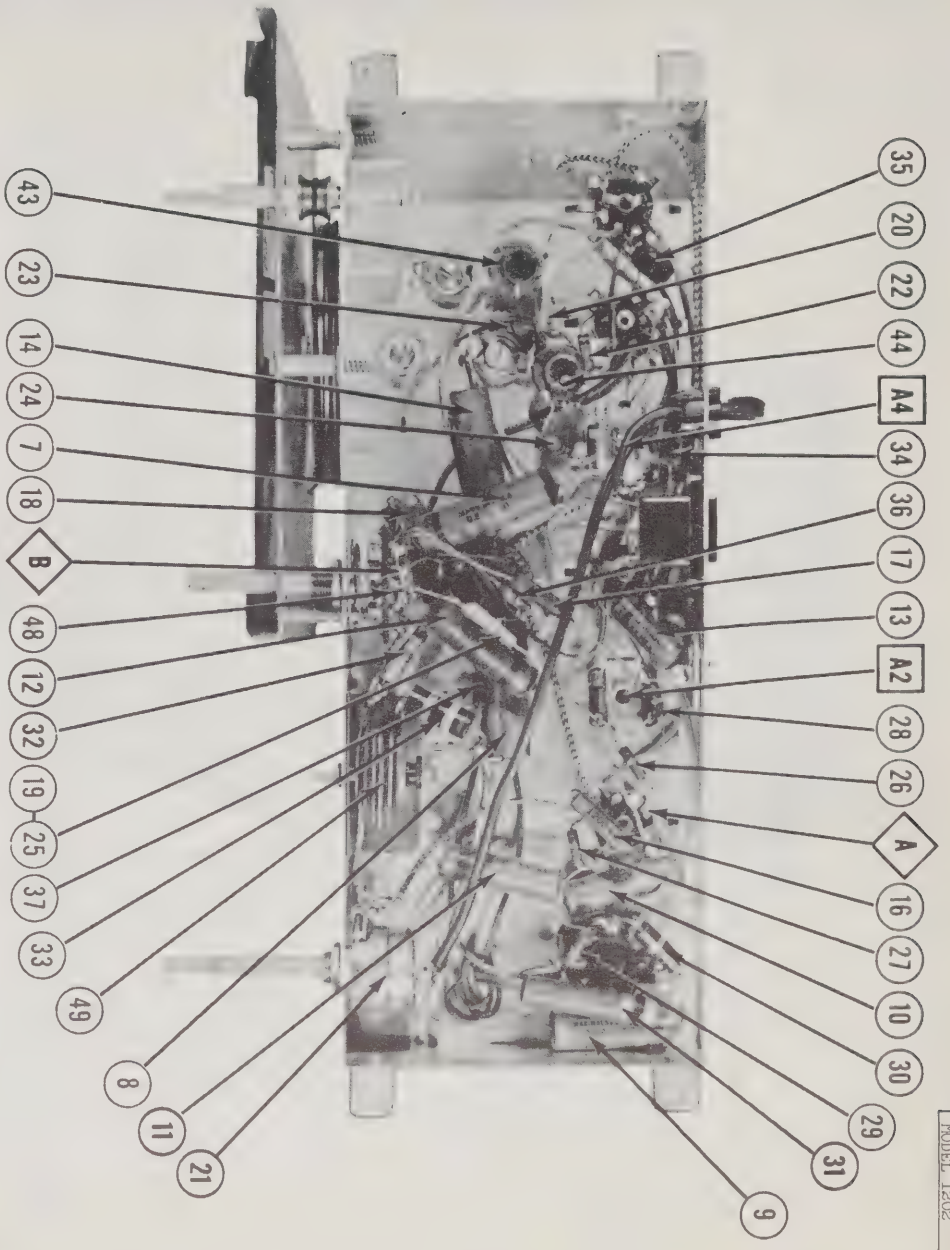
MISCELLANEOUS

ITEM No.	PART NAME	STROMBERG-CARLSON PART No.	NOTES
48	Switch	158015	Radio-Phono
49	Rectifier	162034	Selenium (75MA)
50	3 Gang Var. Cap.	110026	(35-467MMF, 19-247MMF, 14-204MMF)
	Dial	122025	
	Dial Pointer	144015	
	Cabinet	108078	

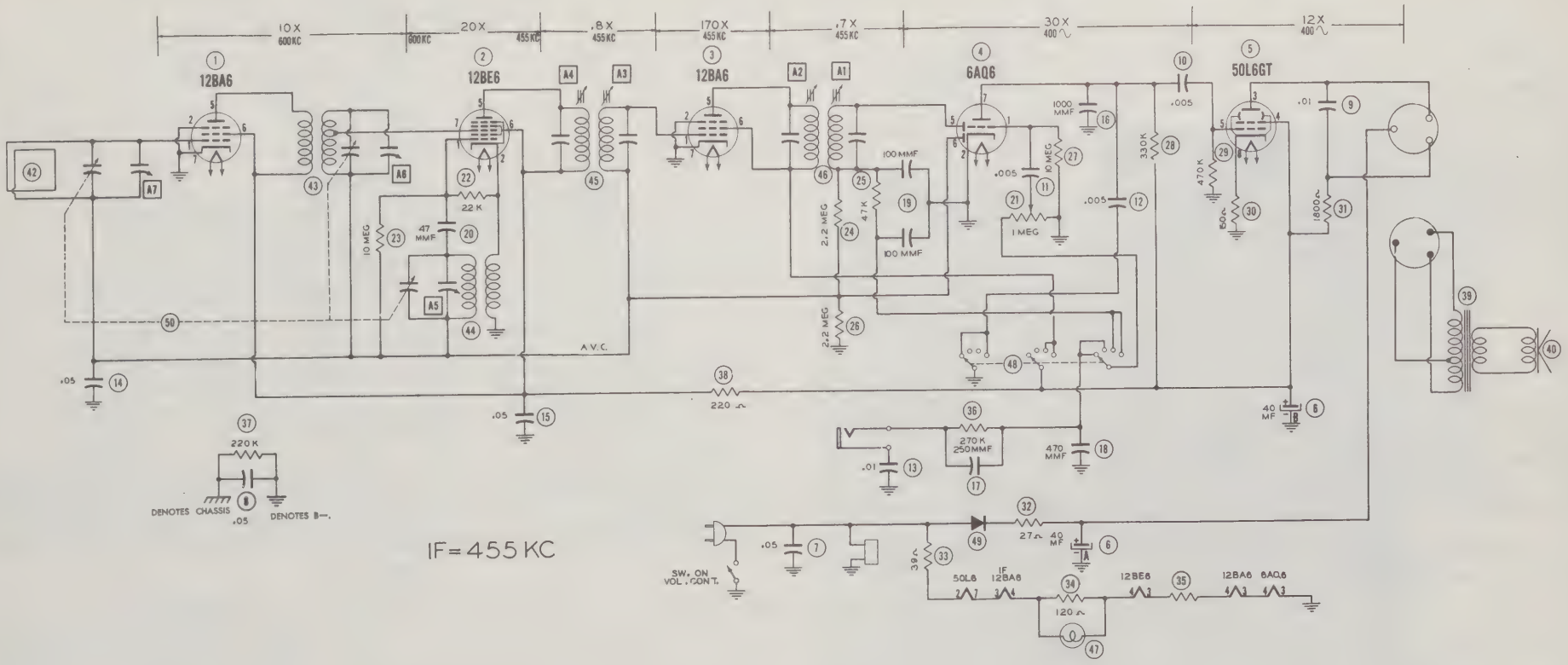


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



STROMBERG-CARLSON MODEL 1202



RADIO-PHONO SWITCH IN RADIO POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BA6	-.7VDC	0V.	6VAC	19VAC	80VDC	80VDC	0V.	-
2	12BE6	-8.2VDC§	0V.	35VAC	47VAC	80VDC	80VDC	-.7VDC	-
3	12BA6	-.7VDC	0V.	60VAC	50VAC	80VDC	80VDC	0V.	-
4	6AQ6	-.6VDC	0V.	0V.	6VAC	-.4VDC	-.7VDC	40VDC	-
5	50L6GT	140VDC	117VAC	138VDC	6.3VDC	0V.	0V.	6.3VAC	5.4VDC

§TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BA6	1.1 Meg.	0Ω	7Ω	19Ω	22KΩ	22KΩ	0Ω	-
2	12BE6	22KΩ	.5Ω	1.1KΩ	1.1KΩ	22KΩ	22KΩ	1.1 Meg.	-
3	12BA6	1.1 Meg.	0Ω	1.1KΩ	1.1KΩ	22KΩ	22KΩ	0Ω	-
4	6AQ6	10 Meg.	0Ω	0Ω	7Ω	900KΩ	1.1 Meg.	350KΩ	-
5	50L6GT	2.8K	1.2K	2.8K	22K	4.0K	0Ω	1.1KΩ	150Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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493-21

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

SUPREME (LIPAN)
MODEL 750

SUPREME (LIPAN)
MODEL 750

SUPREME (LIPAN) MODEL 750

TRADE NAME	Supreme (Lipan), Model 750
MANUFACTURER	Aim Industries, 41 Union Square, New York, 3, N.Y.
TYPE SET	AC Operated Poratable Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50L6GT Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1720KC RATING .25 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer parallel with sides of dial.
Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chassis.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A5 for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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DATE 2/49-#493-22 SET #55-FOLDER #22

PARTS LIST AND DESCRIPTIONS

SUPREME (LIPAN)
MODEL 750

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: LIPAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35W4	35W4	5BJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: LIPAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150		PRS4030-2	EDL5315C	DSB-303	TA-307	Filter-Red
B	30	150						" -Blue
C	20	25						Cath. Bypass-Yellow
7	.05	400		484-05	GT4S5	ST-4-05	TC-15	Line Filter
8	.02	400		484-02	GT4S2	ST-4-02	TC-12	Output Plate Bypass
9	.01	400		484-01	GT4S1	ST-4-01	TC-11	Audio Coupling
10	.002	400		484-002	GT6D2	ST-6-002	TC-22	" "
11	.01	400		484-01	GT4S1	ST-4-01	TC-11	Tone Compensation
12	.05	400		484-05	GT4S5	ST-4-05	TC-15	AVC Filter
13	200	500		1468-0002	5W5T2	MO.5-32	1FM-32	AF Plate Bypass
14	200	500		1468-0002	5W5T2	MO.5-32	1FM-32	Diode RF Filter
15	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.-Cer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: LIPAN PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500KΩ	½		D11-133	M-58-S	Volume Control
B	Shaft			A	Not Req.	Attach to 16A per instructions
C	Switch			41	SW-A	" " " "
17A	50KΩ	½		D11-123	M-44-S	Tone Control
B	Shaft			A	Not Req.	Attach to 17A per instructions

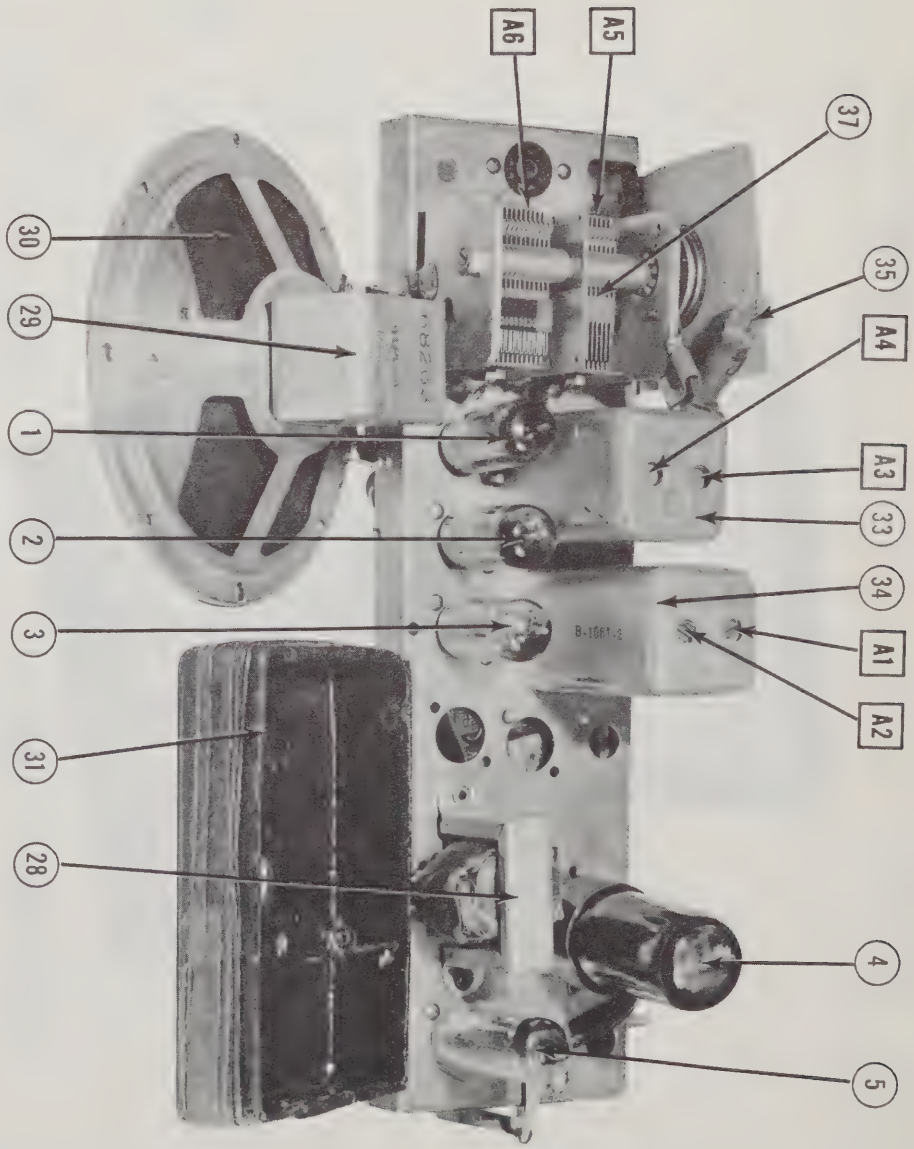
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: LIPAN PART No.	IRC PART No.	IDENTIFICATION CODES
18	24KΩ	½		BTS-22K	Red-Yl.-Or. Osc. Grid
19	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
20	150Ω	½		BW-½-150	Br.-Grn.-Br. IF Cathode
21	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
22	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load
23	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
25	1500Ω	1		BTA-1500	Br.-Grn.-Red Filter
26	24KΩ	½		BTS-27K	Red-Yl.-Or. Phono Tone Comp.
27	24KΩ	½		BTS-27K	Red-Yl.-Or. " " "

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: LIPAN PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
28	1650Ω	3.6Ω	106Ω tapped @ 5.5Ω	.2Ω	S-1021	A-3330		A-3031	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: LIPAN PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
29	FIELD PM	VC IMP. 3.6Ω	68263	ST-105 Mod. P5-X	5A15	
30	CONE DIA. 4"	VC DIA. 9/16"				

R F COILS

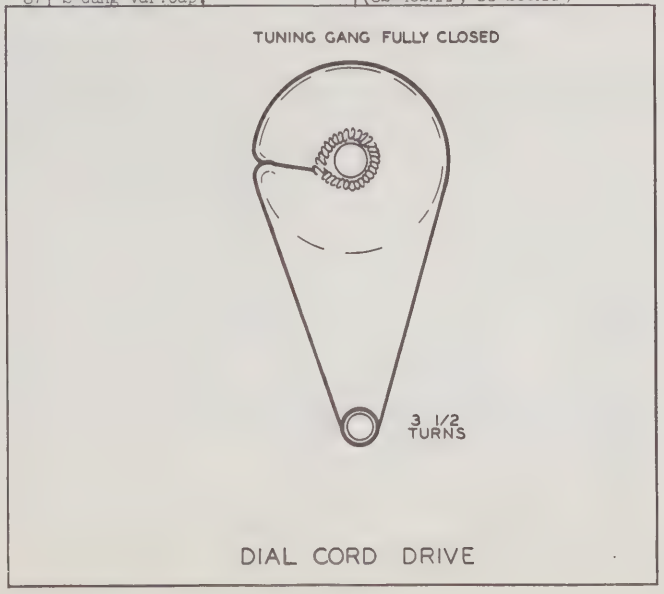
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: LIPAN PART No.	MEISSNER PART No.	
31	Loop Ant.		2.8Ω			
32	Osc. Coil		6Ω			
33	Input IF	13Ω	13Ω			
34	Output IF	7Ω	16.5Ω			

DIAL LIGHT

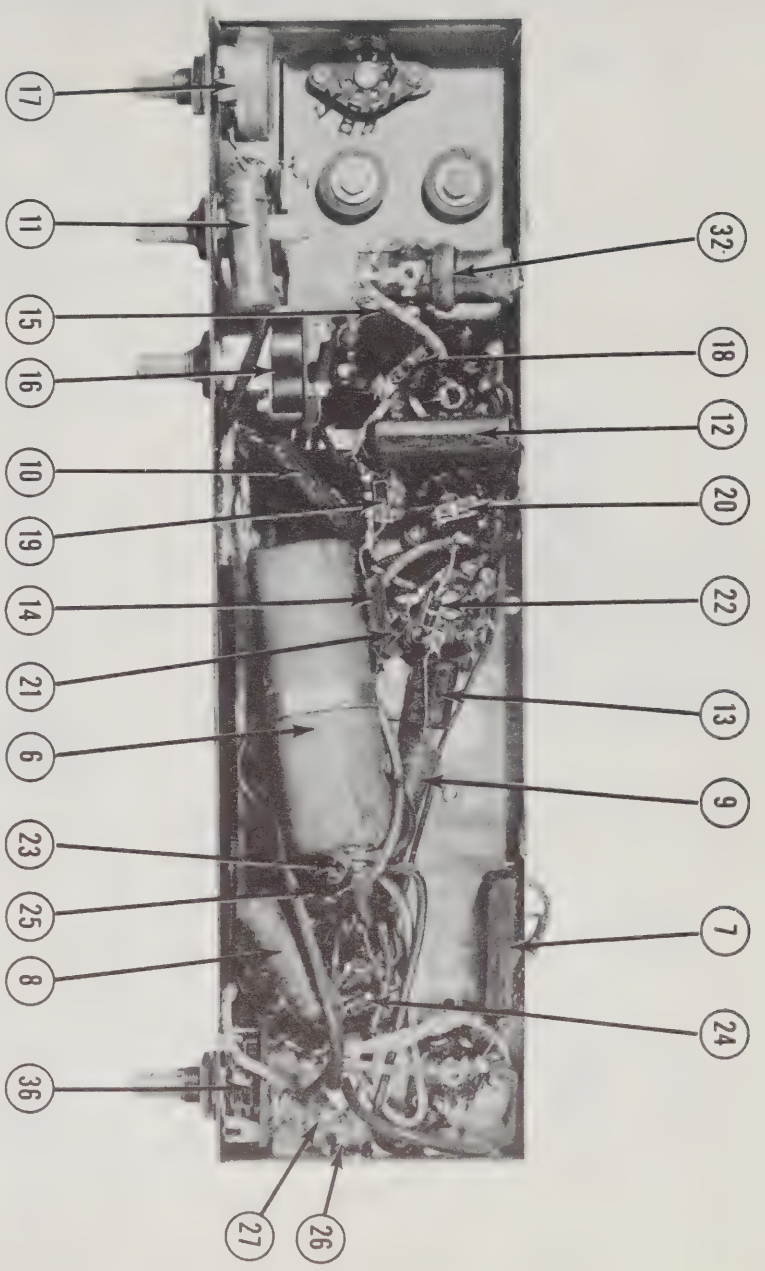
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: LIPAN PART No.		INSTALLATION NOTES
35	Bayonet	6-8	0.15	Brown			Type 47

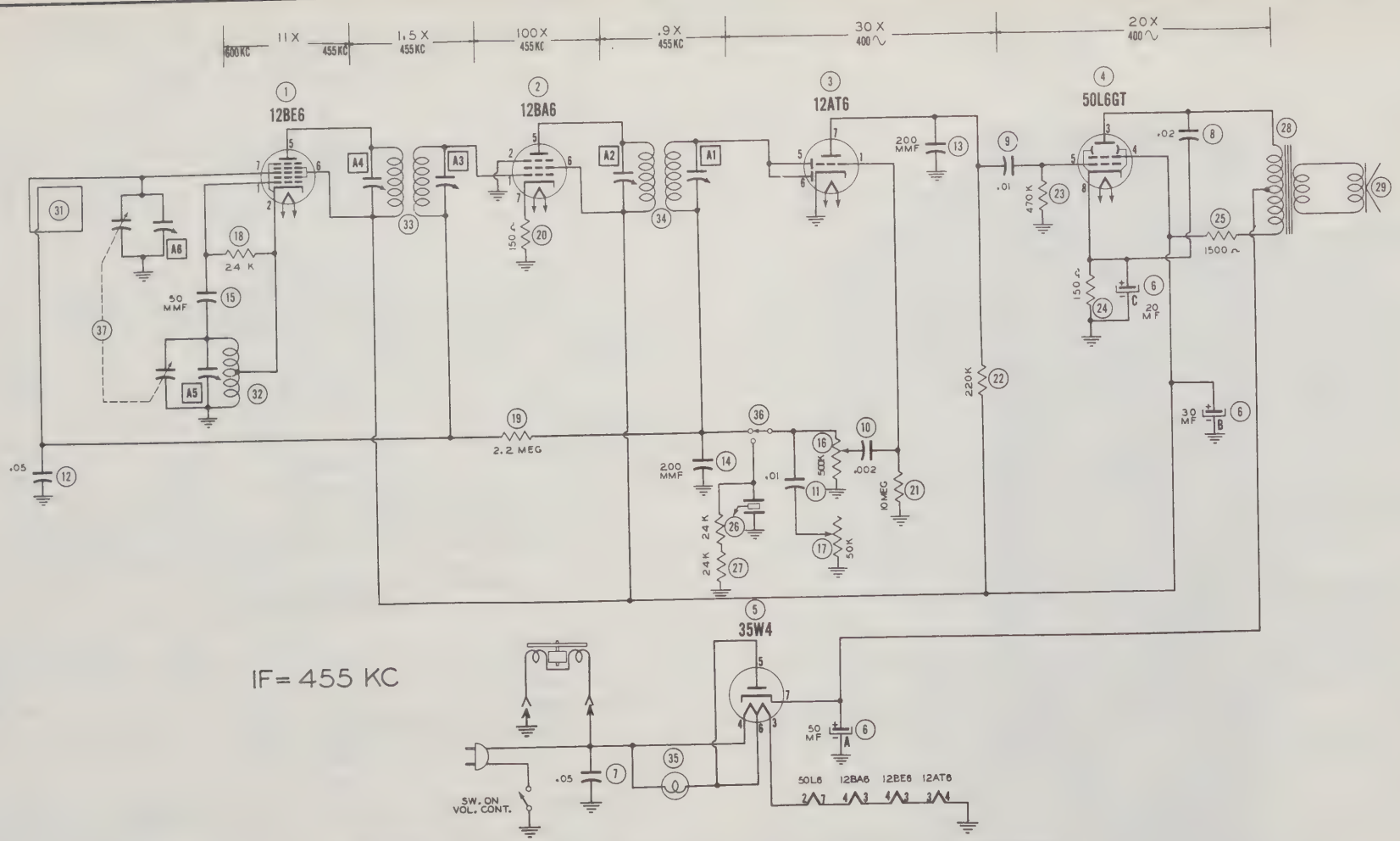
MISCELLANEOUS

ITEM No.	PART NAME	LIPAN PART No.	NOTES
36 37	Switch 2 Gang Var.Cap.		Radio-Phono (32-482MMF, 33-200MMF)



CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

RADIO-PHONO SWITCH IN RADIO POSITION.

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	-11VDC§	0V.	12VAC	25VAC	95VDC	95VDC	-.2VDC	-
2	12BA6	0V.	0V.	25VAC	38VAC	95VDC	95VDC	1VDC	-
3	12AT6	-.6VDC	0V.	12VAC	0V.	-.6VDC	-.6VDC	50VDC	-
4	50L6GT	0V.	85VAC	118VDC	95VDC	0V.	125VDC	38VAC	7.5VDC
5	35W4	0V.	0V.	85VAC	117VAC	112VAC	112VAC	125VDC	-

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	24KΩ	1Ω	12Ω	24Ω	40KΩ	40KΩ	2.7 Meg.	-
2	12BA6	2.7 Meg.	0Ω	24Ω	36Ω	40KΩ	40KΩ	150Ω	-
3	12AT6	10 Meg.	0Ω	12Ω	0Ω	500KΩ	500KΩ	260KΩ	-
4	50L6GT	INF.	65Ω	40KΩ	40KΩ	470Ω	40KΩ	36Ω	150Ω
5	35W4	INF.	INF.	85Ω	120Ω	112Ω	112Ω	40KΩ	-

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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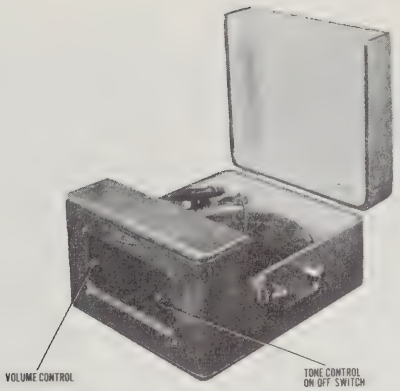
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

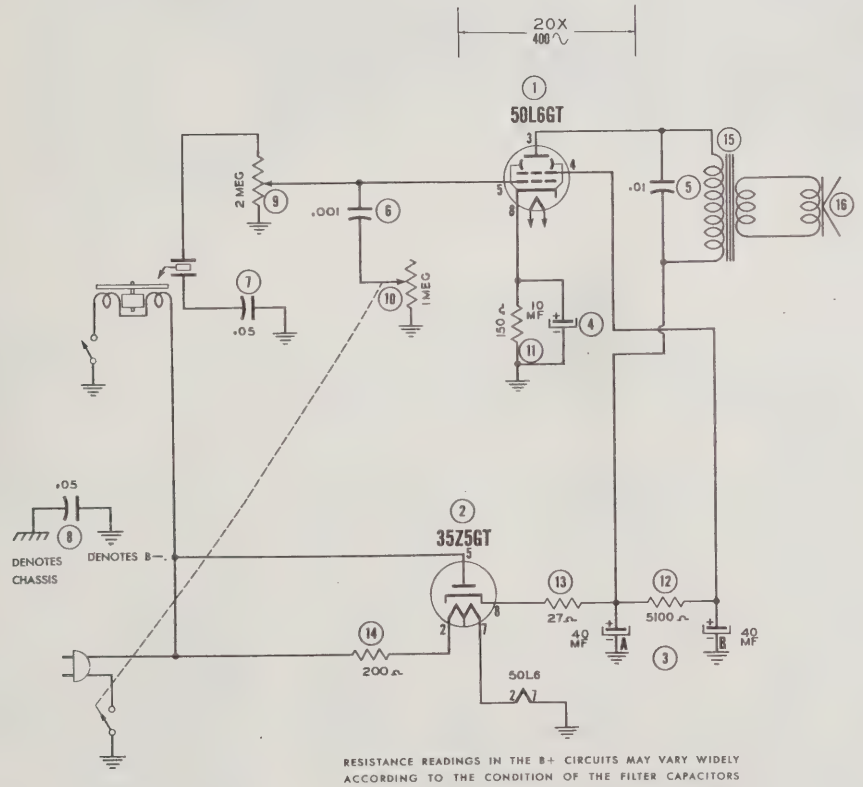
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

WEBSTER-CHICAGO
MODEL 161-1



WEBSTER-CHICAGO MODEL 161-1

TRADE NAME	Webster-Chicago, Model 161-1
MANUFACTURER	Webster-Chicago, 5610 Bloomington Ave., Chicago 39, Ill.
TYPE SET	AC Operated Phono Player with 2 Tube Amplifier
TUBES (TWO)	Types, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-120 Volts AC RATING .23 Amp. @ 117 Volts AC



Pin No.	50L6GT Volt.	Res.
1	0V.	INF.
2	50VAC	50Ω
3	125VDC	50KΩ
4	113VDC	55KΩ
5	0V.	2 Meg.
6	0V.	0Ω
7	0V.	0Ω
8	8VDC	150Ω

Pin No.	35Z5GT Volt.	Res.
1	0V.	0Ω
2	85VAC	85Ω
3	80VAC	78Ω
4	0V.	INF.
5	117VAC	285Ω
6	113VDC	50KΩ
7	50VAC	50Ω
8	135VDC	50KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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DATE 2/49-#493-23 SET #55-FOLDER #23

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	5CL6GT	50L6GT	7AC	
2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WEBSTER-CHIC. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	40	150		PRS150/40-40	EDL4415	DSB-2X40-150	TA-440	Filter-Red
B	40	150					" - "	
4	10	25		PRS25/10	BR102A	[illegible]-10-25	TA-10	Cathode Bypass
5	.01	400		484-01	GT4S1	ST-4-01	TC-11	Output Plate Bypass
6	.001	600		684-001	GT6D1	ST-6-001	TC-21	Tone Comp.
7	.05	600		684-05	GT6S5	ST-6-05	TC-15	Phono Isolation
8	.05	600		684-05	GT6S5	ST-6-05	TC-15	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
9A	2 Meg.	½		D13-139	AM-66-Z	Volume Control
B	Shaft			E	KSS-3	Attach to 9A per instructions
10A	1 Meg.	½		D13-137	AM-63-Z	Tone Control
B	Shaft			E	KSS-3	Attach to 10A per instructions
C	Switch			41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	IRC PART No.	IDENTIFICATION CODES
11	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
12	5100Ω	½		BTS-4700	Grn.-Br.-Red Filter
13	27Ω	½			Red-V1.-Blk. Surge Limiter
14	210Ω	10		ABA-250	Line Dropping-See Note

Note-On IRC replacement set slider 210Ω from one end.

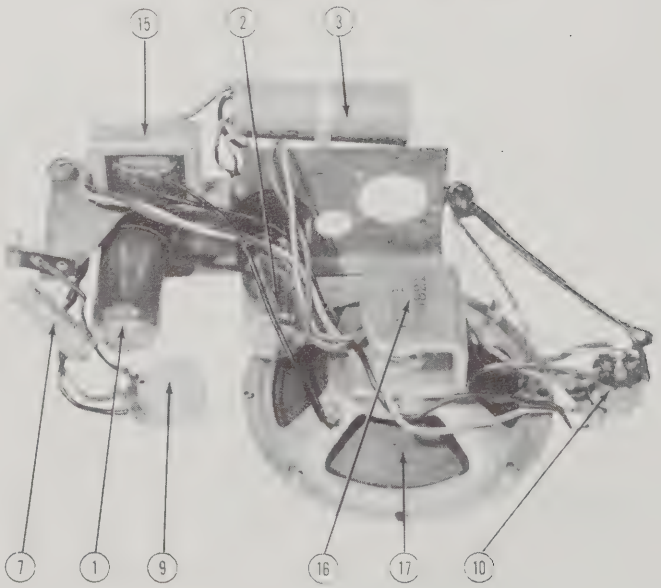
TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
15	2000Ω	4.0Ω	177Ω	.6Ω	67P009	A-3876	T22S45	A-2[illegible]28	

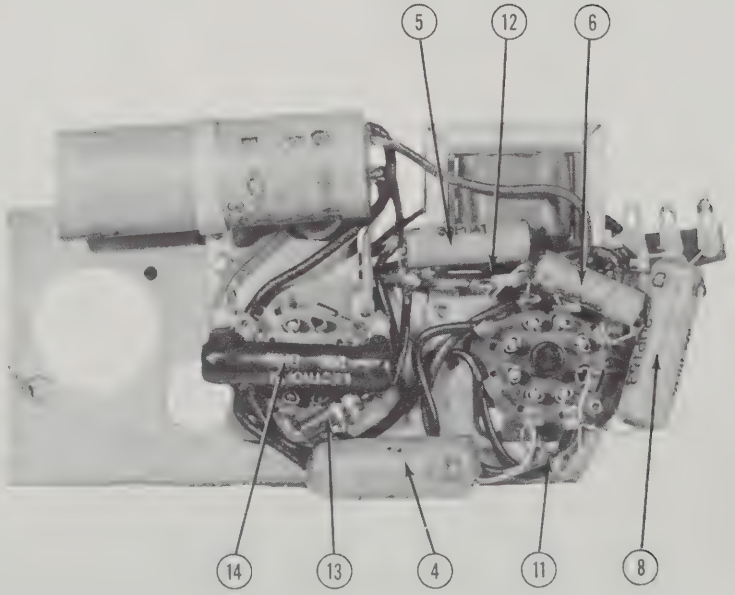
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-105		
16	PM	4.0Ω	76P011	Mod. P5-X	5A15	
	CONE DIA.	VC DIA.				
17	4-7/8"	9/16"				

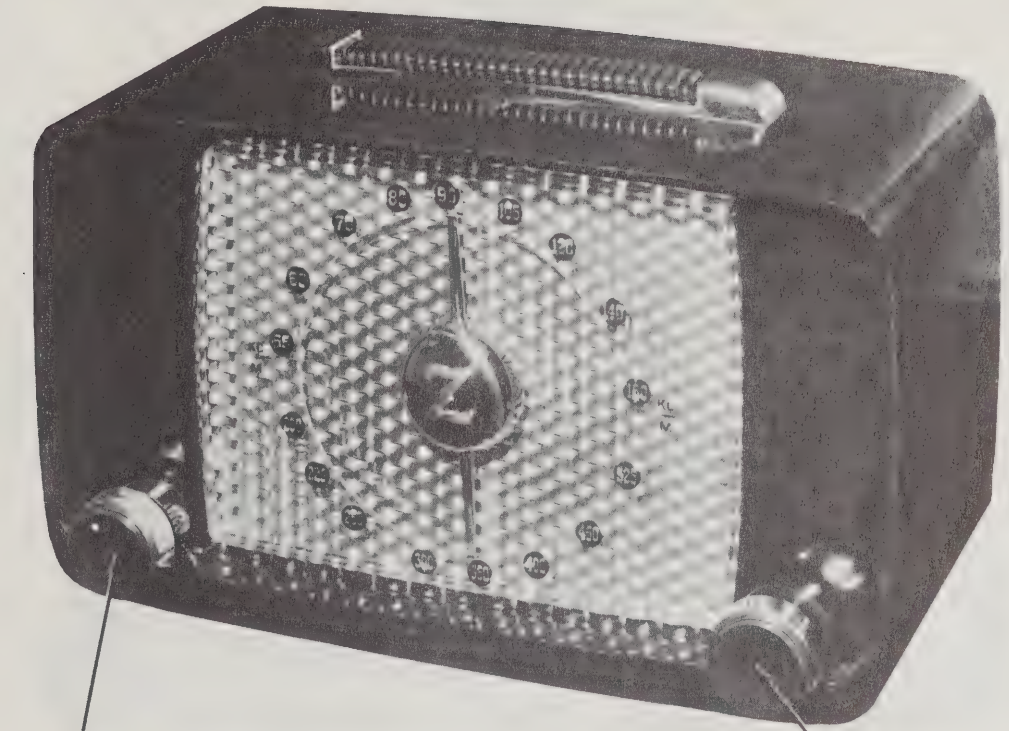
CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



ZENITH MODELS 6D815,
6D815W, 6D815Y (Ch. 6E05)



ZENITH MODELS 6D815,
6D815W, 6D815Y (Ch. 6E05)

ZENITH MODEL 6D815

TRADE NAME	Zenith, Models 6D815, 6D815W, 6D815Y (Ch. 6E05)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 35L6GT Power Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	535-1620KC RATING .25 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS

To set dial pointer install receiver in cabinet, turn tuning cap. fully closed and set pointer parallel with base of dial.

Use isolation transformer if available. If not, connect a .1 MFD cap. in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. A special alignment wrench (Zenith Part #68-7) is necessary for adjustment of A1 thru A4.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.5 MFD.	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	455KC	Tuning cap. fully closed	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1620KC	Tuning cap. fully open.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6,A7	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12BA6	12BA6	7BK	
2	Converter	12BE6	12BE6	7CH	
3	IF Amp.	12BA6	12BA6	7BK	
4	Det.-AVC-AF	12AT6	12AT6	7BT	
5	Power Amp.	35L6GT	35L6GT	7AC	
6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	80	150	22-1808	AF8880§	UP8415	DY-8040-150	D5183	■ Filter-See Note
B	40	150						▲ "
8	.047	400	22-1775	484-05	GT4S5	ST-4-05	TC-15	Line Filter
9	.01	400	22-1182	484-01	GT4S1	ST-4-01	TC-11	Output Plate Bypass
10	.05	200	22-178	484-05	GT2S5	ST-4-05	TC-15	Feedback
11	.05	200	22-829	484-05	GT2S5	ST-4-05	TC-15	AVC Filter
12	.07	200	22-829	484-075	GT2S5	ST-4-05	72P1	Line Isolation
13	.05	200	22-829	484-05	GT2S5	ST-4-05	TC-15	RF Bypass Power Supply-Note
14A	7000	300	105-14	1467-008	1D3D7	MW.3-27	1FM-27	Audio Coupling -Cer.
B	5000	300		1467-005	1D5D5	MW.5-25	1FM-25	" " - "
C	500	300		1468-0005	5W5T5	MO.5-35	1FM-35	1st AF Plate Bypass "

§Parallel sections to obtain desired capacity.
Note-If Item 7A, B is replaced with electrolytic other than Zenith Part #22-1808. Item 13 must be added.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
15A	1 Meg.	½	63-1664	D13-137	AM-63-2	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 15A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

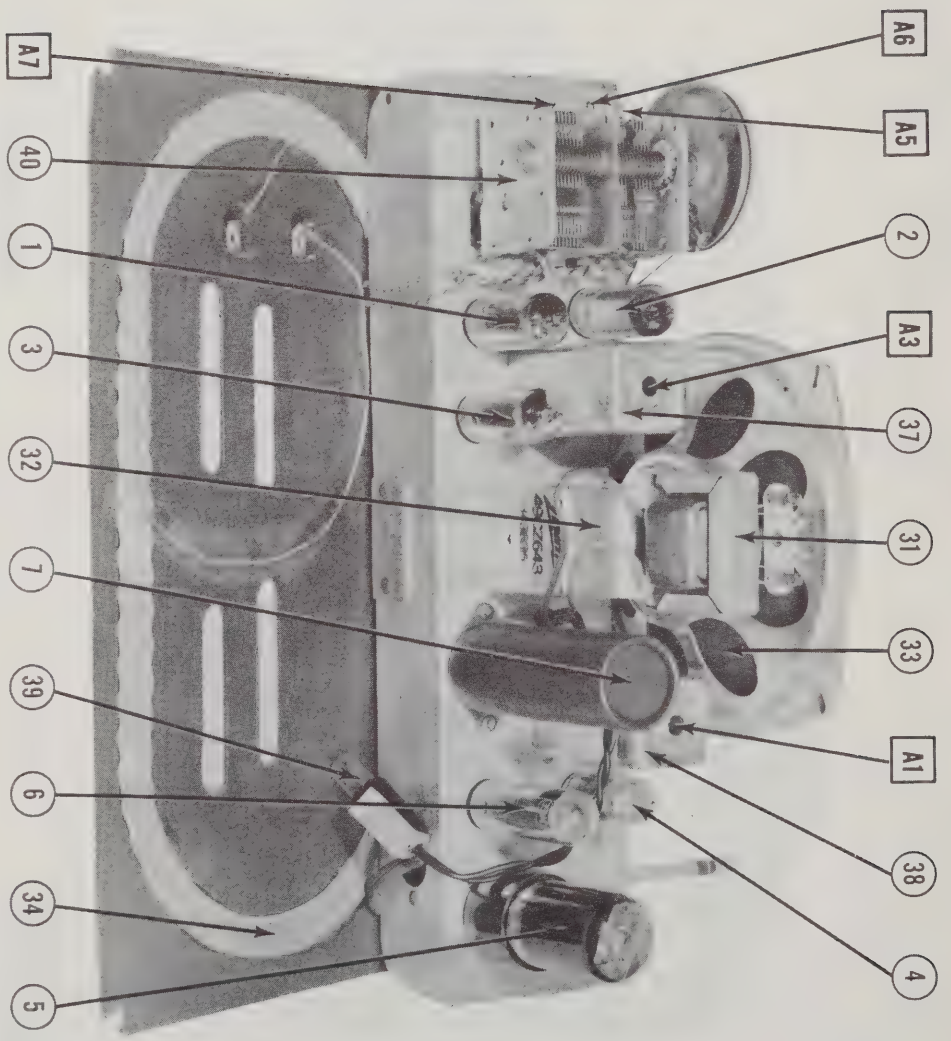
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	IDENTIFICATION CODES
16	330Ω	½	63-1765	BW-½-330	Or.-Or.-Br. RF Cathode
17	10KΩ	½	63-1828	BTS-10K	Br.-Blk.-Or. RF Plate
18	1000Ω	½	63-1786	BTS-1000	Br.-Blk.-Red Parasitic Supp.
19	22KΩ	½	63-1842	BTS-22K	Red-Red-Or. Osc. Grid
20	100Ω	½	63-1744	BW-½-100	Br.-Blk.-Br. IF Cathode
21	2.2 Meg.	½	63-1926	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
22	1 Meg.	½	63-1912	BTS-1 Meg.	Br.-Blk.-Grn. Diode Load
23	1000Ω	½	63-1786	BTS-1000	Br.-Blk.-Red Series Volume Control-See Note
24	4700Ω	½	63-1814	BTS-4700	Yl.-Vi.-Red Feedback
25	4.7 Meg.	½	63-1940	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
26	470KΩ	½	63-1898	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
27	470KΩ	½	63-1898	BTS-470K	Yl.-Vi.-Yl. Output Grid
28	150Ω	½	63-686	BW-½-150	Br.-Grn.-Br. Output Cathode
29	1000Ω	1	63-1574	BTA-1000	Br.-Blk.-Red Filter
30	22Ω	½	63-1219		Red-Red-Blk. Surge Limiter

Note-Some models use 2200Ω ½ W. Part #63-1800 in this application.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
31	2800Ω	3.4Ω	265Ω	.5Ω	206-643	A-3876#	T22S45#	A-2928#	#Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ZENITH PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-10§*		†Fabricate new mounting bracket.
32	PM	3.4Ω	49-643	Mod. P6-X	5A21†	*Use adaptor baffle.
	CONE DIA.	VC DIA.				
33	5-1/8"	9/16"	208-643			

R F COILS

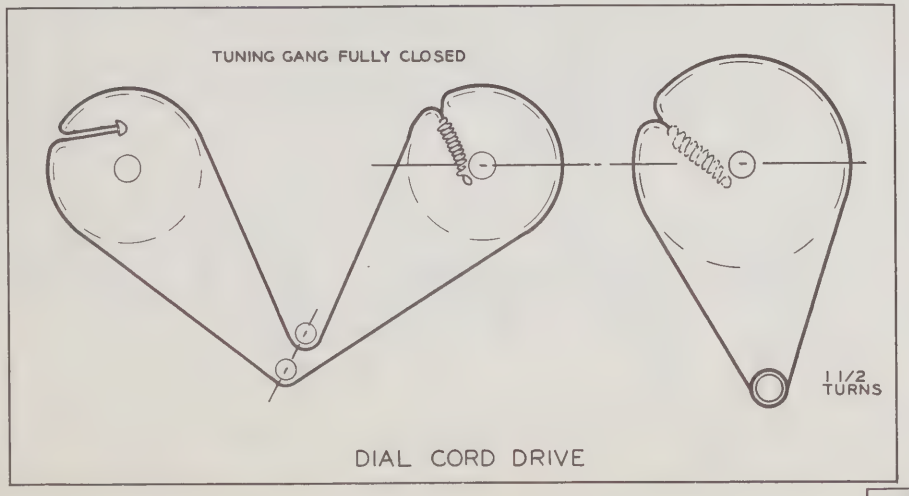
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	
34	Loop Ant.		3Ω	S-14838		
35	RF Coil	2.5Ω	9.7Ω	S-14832		
36	Osc. Coil	.4Ω	8Ω	S-14833	14-1060‡	‡Add 50 MMFD cap. from high side tuning cap. to osc. grid.
37	Input IF	20Ω	20Ω	95-1101		
38	Output IF	20.5Ω	20.5Ω	95-1102		

DIAL LIGHT

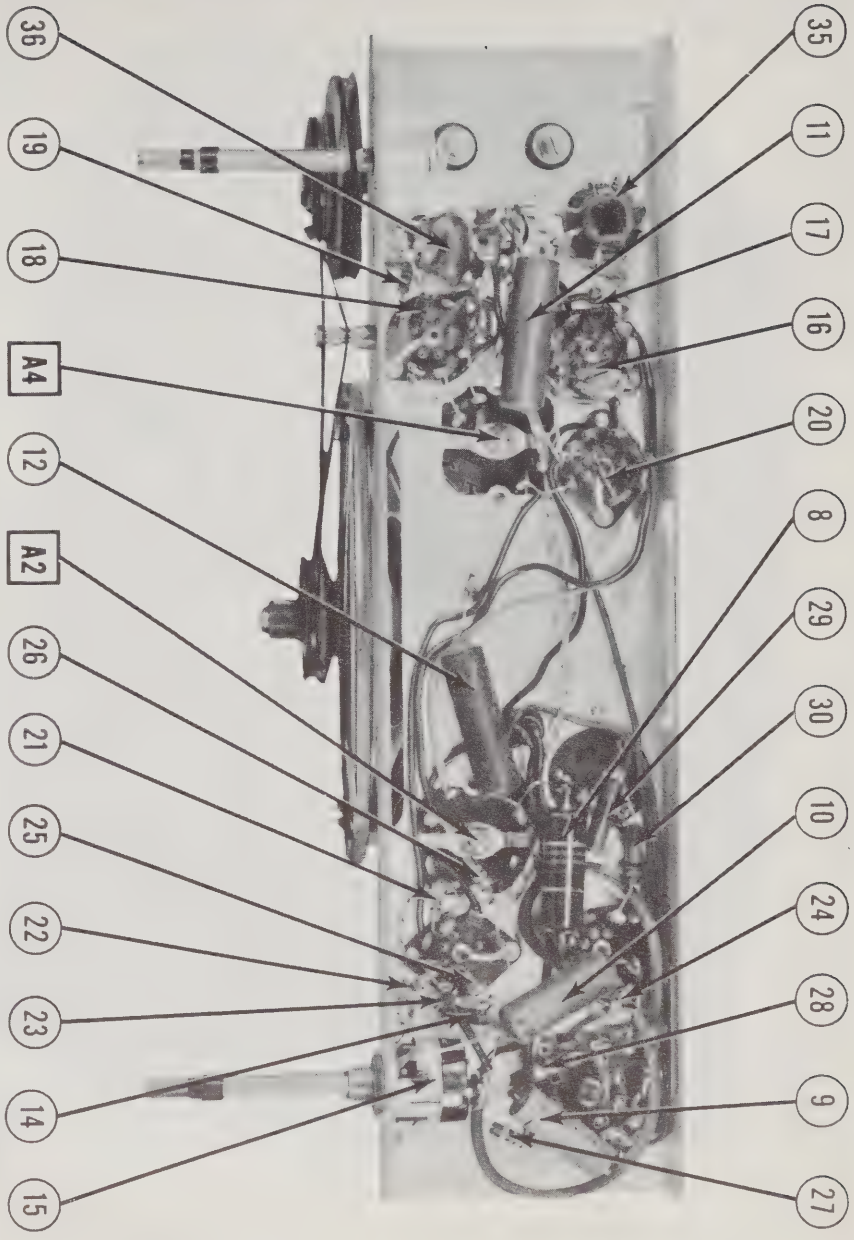
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ZENITH PART No.		INSTALLATION NOTES
39	Bayonet	6-8	0.15	Brown	100-67		Type #47

MISCELLANEOUS

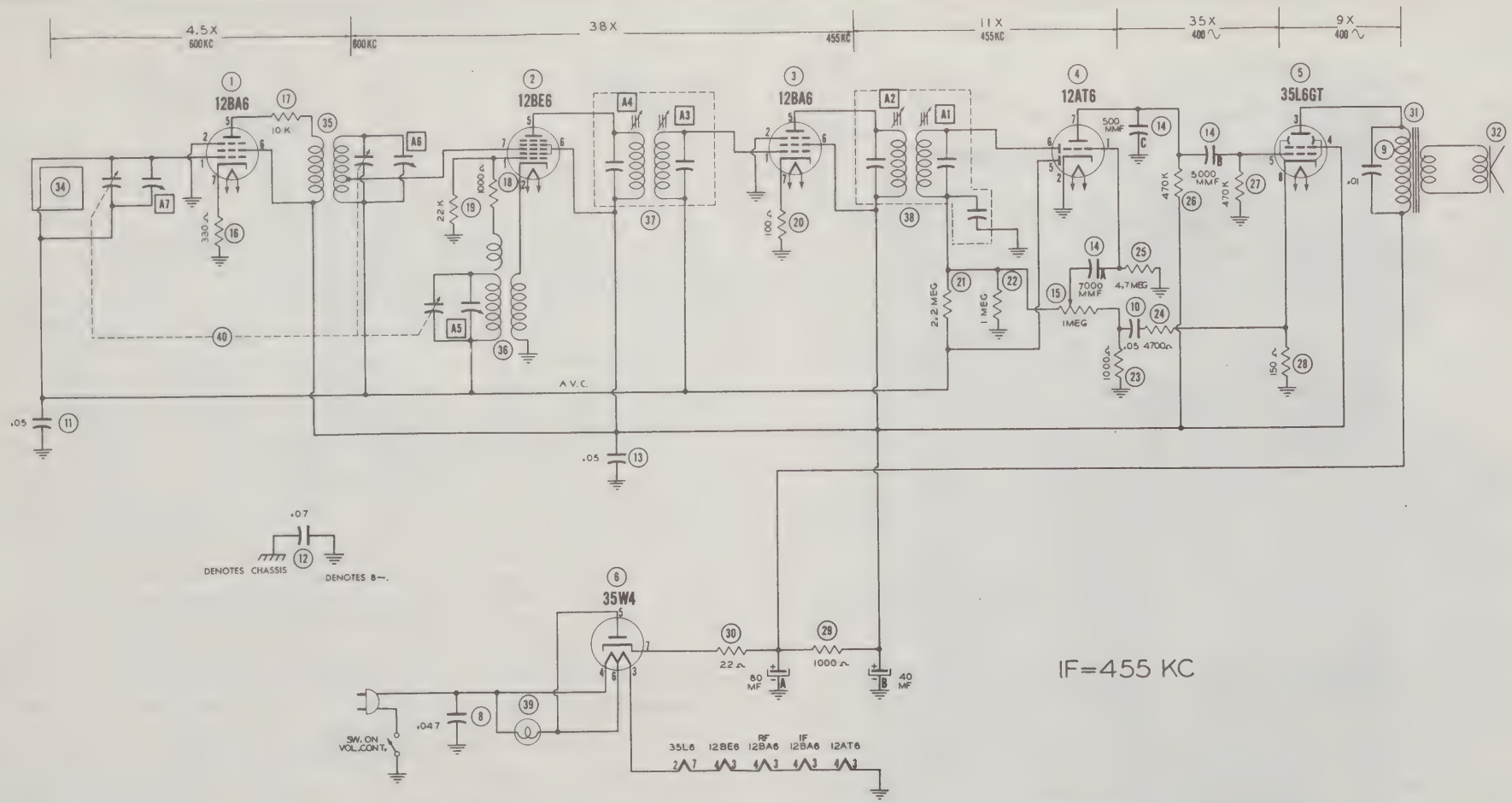
ITEM No.	PART NAME	ZENITH PART No.	NOTES
40	3 Gang Var. Cap.	22-1805	(17-352MMF, 15-222MMF, 14-84MMF)
	Dial Scale	26-411	
	Dial Pointer	59-219	
	Cabinet	14-1015	Model 6D815
	"	14-1015W	Model 6D815W
	"	14-1015Y	Model 6D815Y
	Knob	46-744	Model 6D815
	"	46-744Y	Models 6D815W, 6D815Y



CHASSIS—BOTTOM VIEW



ZENITH MODEL 6D815



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BA6	-.5VDC	0V.	24VAC	38VAC	50VDC	92VDC	2VDC	-
2	12BE6	-8.9VDC§	0V.	38VAC	49VAC	92VDC	92VDC	-.5VDC	-
3	12BA6	-.5VDC	0V.	12VAC	24VAC	92VDC	92VDC	1VDC	-
4	12AT6	-.6VDC	0V.	0V.	12VAC	-.5VDC	-.5VDC	35VDC	-
5	35L6GT	0V.	84VAC	112VDC	92VDC	0V.	120VDC	49VAC	5.2VAC
6	35W4	5.1VDC	0V.	84VAC	117VAC	110VAC	110VAC	122VDC	-

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BA6	2.7 Meg.	0Ω	24Ω	36Ω	140KΩ	130KΩ	330Ω	-
2	12BE6	22KΩ	.4Ω	36Ω	48Ω	130KΩ	130KΩ	2.7 Meg.	-
3	12BA6	2.7 Meg.	0Ω	12Ω	24Ω	130KΩ	130KΩ	100Ω	-
4	12AT6	4.7 Meg.	0Ω	0Ω	12Ω	3.2 Meg.	500KΩ	600KΩ	-
5	35L6GT	INF.	80Ω	130KΩ	130KΩ	470KΩ	130KΩ	48Ω	150Ω
6	35W4	5KΩ	INF.	80Ω	105Ω	100Ω	100Ω	130KΩ	-

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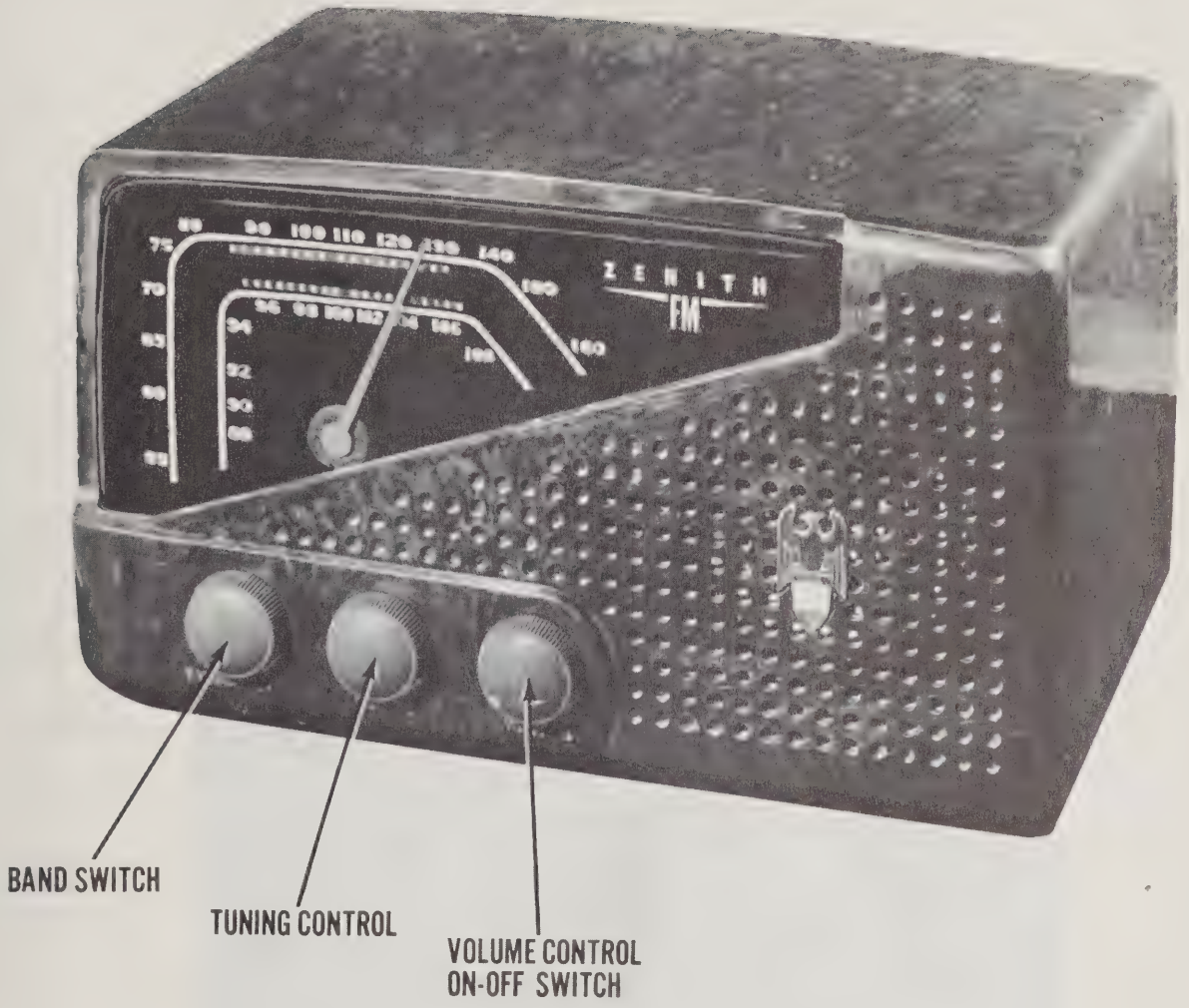
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ZENITH MODELS 7H822 (Ch. 7E02), 7H822Z, 7H822WZ (Ch. 7E02Z)

ZENITH MODELS 7H822 (Ch. 7E02), 7H822Z, 7H822WZ (Ch. 7E02Z)



ZENITH MODELS 7H822 (Ch. 7E02), 7H822Z, 7H822WZ (Ch. 7E02Z)

ZENITH MODEL 7H822

TRADE NAME	Zenith, Models 7H822 (Ch. 7E02), 7H822Z, 7H822WZ (Ch. 7E02Z)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (SEVEN)	Types, 12BA6 FM RF Amp., 12BE6 Converter, 12BA6 1st IF Amp., 12BA6 FM 2nd IF Amp., 12AU6 Limiter, 19T8 Det.-AVC-AF, 35B5 Power Output.
POWER SUPPLY	110-120 Volts AC-DC RATING .30 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis , Indiana

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DATE 2/49-#493-25 SET #493-25

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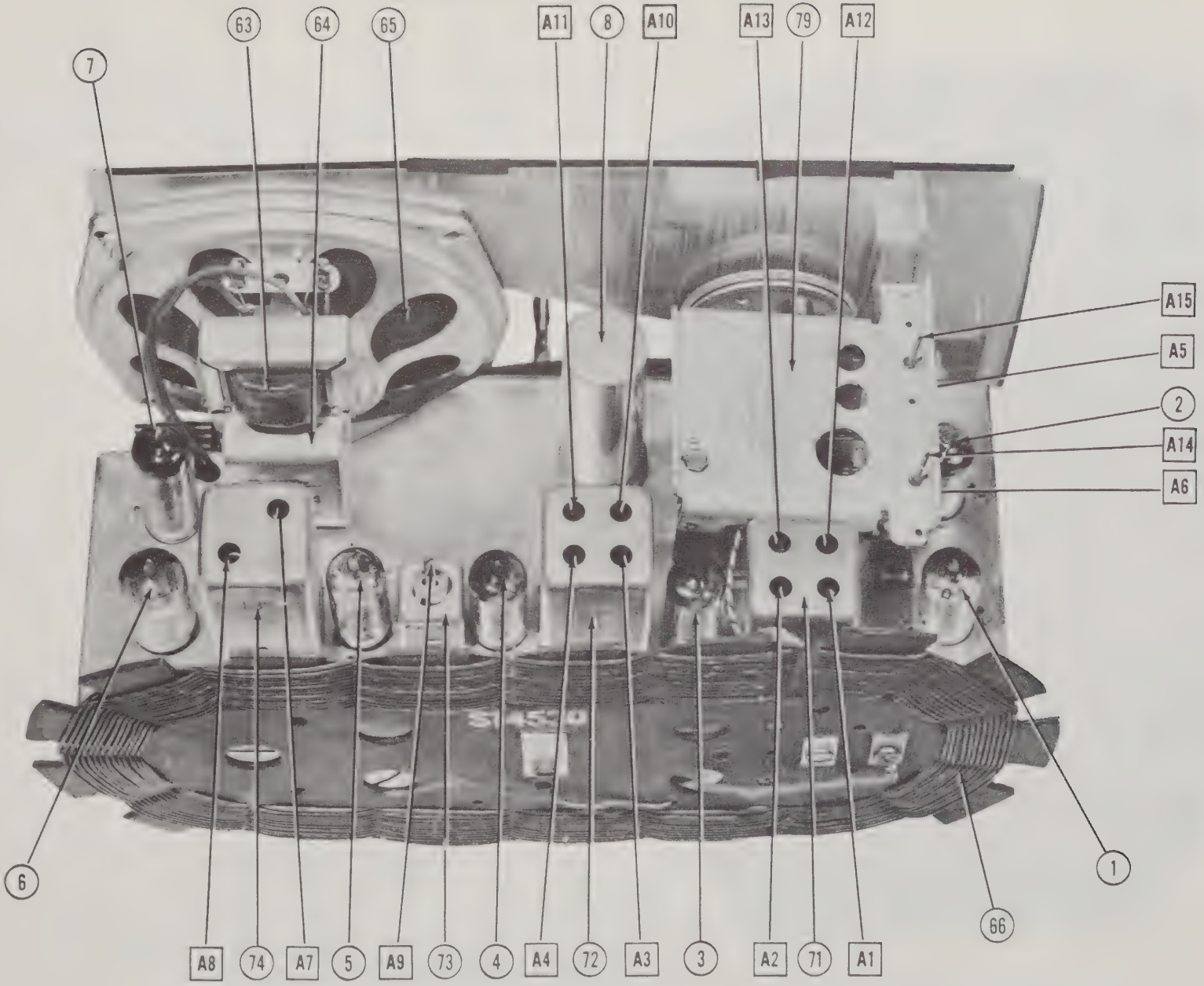
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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
1	FM RF Amp.	12BA6	12BA6	7BK	
2	Converter	12BE6	12BE6	7CH	
3	1st IF Amp.	12BA6	12BA6	7BK	
4	FM 2nd IF	12BA6	12BA6	7BK	
5	Limiter	12AU6	12AU6	7BK	
6	Det.-AVC-AF	19T8	19T8		
7	Power Output	35B5	35B5	7BZ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5A	80	150	22-1757	AF888D*	UP8415	DY-8040-150	D5179	■ Filter
B	40	150						▲ "
9	.05	400	22-1017	484-05	GT4S5	ST-4-05	TC-15	Line Filter
10	.01	400	22-1126	484-01	GT4S1	ST-4-01	TC-11	Output Plate Bypass
11	.005	500	22-229	684-005	GT6D5	ST-6-005	TC-25	Audio Coupling
12	.02	600	22-830	684-02	GT6S2	ST-6-02	TC-12	" "
13	.05	200	22-829	484-05	GT2S5	ST-4-05	TC-15	Feedback
14	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	Limiter Decoupling
15	.002	600	22-1220	684-002	GT6D2	ST-6-002	TC-22	2nd IF Decoupling
16	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	2nd IF Cathode Bypass
17	.002	600	22-1220	684-002	GT6D2	ST-6-002	TC-22	1st IF Decoupling
18	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	AVC Filter
19	.05	200	22-829	484-05	GT2S5	ST-4-05	TC-15	" "
20	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	Conv. Decoupling
21	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	Conv. Screen Bypass
22	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	RF Bypass
23	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	FM Ant. Isolation
24	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	Fil. Bypass
25	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	" "
26	.01	200	22-1385	484-01	GT2S1	ST-4-01	TC-11	" "
27	.0005	500	22-854	1468-0005	GT6T5	ST-6-0005	TC-35	AF Plate Bypass
28	75	300	22-1507	1468-000025	5W5Q25	MO.5-425	1FM-425	IF Coupling Cer.
29	30	300	22-1765		5R5Q3	MOS.5-43	MS-43	Fixed Trimmer "
30	50	300	22-1492	1469-00005	5R5Q5	MOS.5-45	MS-45	Osc. Grid Cap. "
31	1000	300	22-1676	1468-001	1W5D1	MW.5-21	1FM-21	RF Plate Decoup. "
32	19	300	22-1688					Fixed Trimmer "
33	100	300	22-1669	1468-0001	5W5T1	MO.5-31	1FM-31	RF Cathode Bypass
34	100	300	22-1669	1468-0001	5W5T1	MO.5-31	1FM-31	Line Ant. Coup.
35	50	300	22-1492	1469-00005	5R5Q5	MOS.5-45	MS-45	Fixed Trimmer "
36	.15	200	22-1025	P288-15				Tone Comp.-See Note

*Parallel sections to obtain desired capacity. Note-Used in chassis 7E02Z only.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
36A	1 Meg.	½	63-1646	D11-137	AM-61-S	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 36A per instructions
C	Switch		" "	41	SW-A	" " " " "
81A	100Ks	½	63-2008	D11-128	AM-40-S	Tone Control-See Note
B	Shaft			E	KSS-3	Attach to 81A per instructions

Note-Used on chassis 7E02Z only.

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: MEISSNER PART No.	
66	Loop Ant.		1.5Ω	S14057		
67	FM Ant. Coil	.2Ω	0Ω	S14480		
68	FM RF Coil	0Ω	0Ω	S13871		
69	AM Osc. Coil	.5Ω	5Ω	S14481	14-1060	
70	FM " "		0Ω	S14695		
71A	1st IF-AM	19Ω	19Ω**	S14521		**Includes resistance of both secondaries.
B	1st IF-FM	.5Ω				
72A	2nd IF-AM	16Ω‡	15Ω	S14522		‡Includes resistance of both primaries.
B	2nd IF-FM		1Ω			
73	3rd IF-FM		1Ω	S14509		
74	FM Disc.Trans.	.4Ω	.4Ω	S13973		
75	Fil. Choke		.8Ω	S13997		
76	" "		.3Ω	S13997		

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
77	Switch	85-430	Band
78	Rectifier	212-3	Selenium
79	2 Gang Var. Cap.	22-1742	(16-464MMF, 34-204MMF)
84	Neon Bulb	100-105	On-Off Indicator
	Dial Scale	26-403	Chassis 7E02
	" "	199-35	Chassis 7E02Z
	Dial Pointer	59-146	
	Cabinet	14-1022	Model 7H822
	"	14-857	Model 7H822Z
	"	14-858	Model 7H822WZ
	Knob	46-734	Volume & Tuning (2 Used)
	"	46-735	Bandswitch
	"	46-770	" (Ch. 7E02Z)
	"	46-769	Volume & Tuning (Ch. 7E02Z)
	"	46-780	Tone (Ch. 7E02Z)
	"	46-781	" (Ch. 7E02Z)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	
37	68Ω	½	63-1737		Blue-Gray-Blk. RF Cathode
38	680Ω	½	63-1779	BTS-680	Blue-Gray-Br. RF Decoup.
39	220Ω	½	63-1758		Red-Red-Br. Conv. Screen
40	220Ω	½	63-1758		Red-Red-Br. Conv. Plate Decoup.
41	1Ω	½	63-1223		Br.-Blk.-Gold Parasitic Suppressor
42	100KΩ	½	63-1870	BTS-100K	Br.-Blk.-Yl. AVC Network
43	2.2 Meg.	½	63-1926	BTS-2.2 Meg	Red-Red-Grn. " "
44	47KΩ	½	63-1856	BTS-47K	Yl.-Vi.-Or. Diode Filter
45	1 Meg.	½	63-1912	BTS-1 Meg.	Br.-Blk.-Grn. Diode Load
46	68Ω	½	63-1737		Blue-Gray-Blk. 2nd IF Cathode
47	220Ω	½	63-1758		Red-Red-Br. 2nd IF Decoupling
48	100KΩ	½	63-1870	BTS-100K	Br.-Blk.-Yl. Limiter Grid
49	15KΩ	½	63-1835	BTS-15K	Br.-Grn.-Or. Limiter Voltage Dropping
50	150KΩ	½	63-1876	BTS-150K	Br.-Grn.-Yl. Disc. Diode Load
51	150KΩ	½	63-1876	BTS-150K	Br.-Grn.-Yl. " " "
52	100KΩ	½	63-1870	BTS-100K	Br.-Blk.-Yl. De-emphasis
53	820Ω	½	63-1782	BTS-820	Gray-Red-Br. Tone Comp.
54	2200Ω	½	63-1800	BTS-2200	Red-Red-Red Feedback
55	4.7 Meg.	½	63-1940	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
56	470KΩ	½	63-1898	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
57	470KΩ	½	63-1898	BTS-470K	Yl.-Vi.-Yl. Output Grid
58	150Ω	½	63-686	BW-½-150	Br.-Grn.-Br. Output Cathode
59	1000Ω	3	63-1527	AB-1000	Filter
60	22Ω	1	63-1450	BW-1-22	Red-Red-Blk. Rect. Ballast
61	220Ω	½	63-1758	BW-½-220	Red-Red-Br. 1st IF Decoup.
62	22KΩ	½	63-1842	BTS-22K	Red-Red-Or. Osc. Grid
82	100Ω	½	63-1744		Br.-Blk.-Br. Parasitic Suppressor-See Note
83	220KΩ	½	63-1884	BTS-220K	Red-Red-Yl. Indicator Coupling-See Note

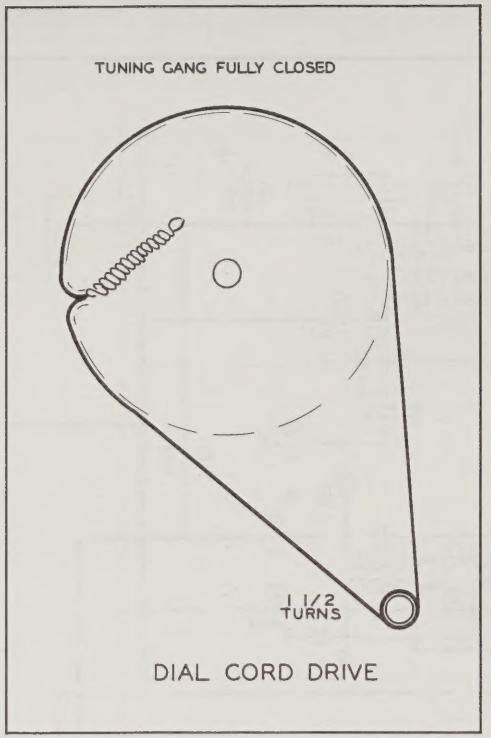
Note-Used on chassis 7E02Z only.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
63	2700Ω	3.3Ω	260Ω	.6Ω	206-634	A-3876#	T22S45#	A-2928#	#Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
*	FIELD	VC IMP.		ST-107§		†Drill and tap magnet frame.
64	PM	3.3Ω	49-634	Mod. P5-V	5A21†	
	CONE DIA.	VC DIA.				§Use adapter baffle if necessary.
65	5-1/8"	9/16"	208-634			



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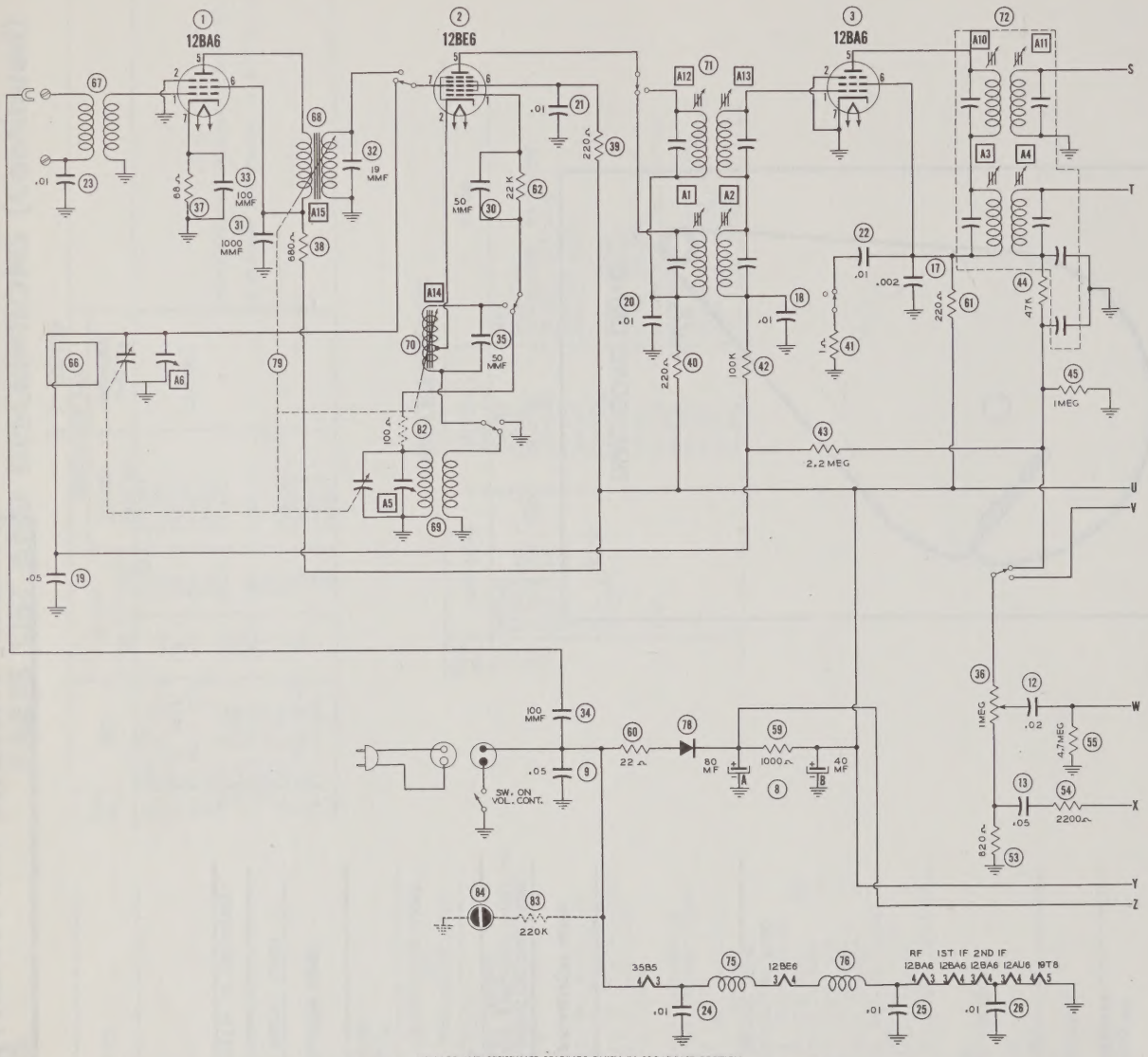

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
‡ 1	12BA6	0V.	0V.	57VAC	70VAC	77VDC	77VDC	.6VDC	–	–
2A	12BE6*	-6VDC§	0V.	80VAC	70VAC	85VDC	85VDC	-.3VDC	–	–
‡ 2B	12BE6	-3.7VDC§	0V.	80VAC	70VAC	85VDC	85VDC	0V.	–	–
3	12BA6	-.4VDC	0V.	57VAC	47VAC	85VDC	85VDC	0V.	–	–
‡ 4	12BA6	0V.	0V.	47VAC	34VAC	85VDC	85VDC	1VDC	–	–
‡ 5	12AU6	-.3VDC	0V.	34VAC	21VAC	45VDC	45VDC	0V.	–	–
6	19T8	-.6VDC	-.7VDC	0V.	21VAC	0V.	-.7VDC	0V.	-.7VDC	30VDC
7	35B5	0V.	4.7VDC	80VAC	117VAC	130VDC	85VDC	0V.	–	–

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
‡ 1	12BA6	0Ω	0Ω	56Ω	70Ω	20KΩ	20KΩ	68Ω	–	–
2A	12BE6	22KΩ	.5Ω	80Ω	70Ω	20KΩ	20KΩ	3.2 Meg.	–	–
‡ 2B	12BE6	22KΩ	0Ω	90Ω	70Ω	20KΩ	20KΩ	0Ω	–	–
3	12BA6	3.3 Meg.	0Ω	56Ω	44Ω	20KΩ	20KΩ	0Ω	–	–
‡ 4	12BA6	1Ω	0Ω	44Ω	30Ω	20KΩ	20KΩ	90Ω	–	–
‡ 5	12AU6	100KΩ	0Ω	30Ω	18Ω	35KΩ	35KΩ	0Ω	–	–
6	19T8	150KΩ	150KΩ	300KΩ	18Ω	0Ω	540KΩ	0Ω	4.7 Meg.	490KΩ
7	35B5	470KΩ	150Ω	80Ω	115Ω	20KΩ	20KΩ	470KΩ	–	–

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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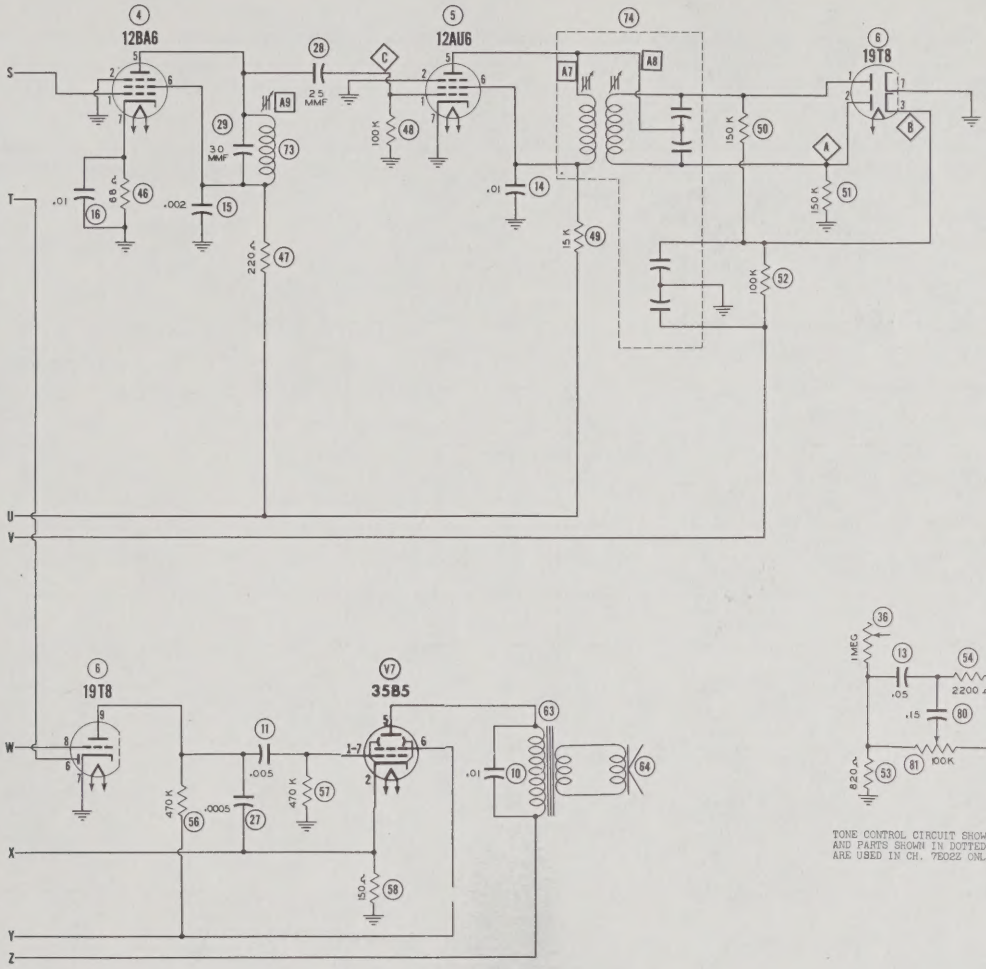

TONE CONTROL CIRCUIT SHOWN ABOVE AND PARTS SHOWN IN DOTTED LINES ARE USED IN CH. 7EO2Z ONLY.

STAGE GAIN MEASUREMENTS

CONVERSION GAIN	45X	IN 600KC OUT 455KC
INPUT IF	.6X	455KC
IF TUBE	150X	455KC
OUTPUT IF	.7X	455KC
AUDIO	35X	400 ∿
OUTPUT	20X	400 ∿

IF = 455 KC AM

IF = 10.7 MC FM

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning capacitor fully closed and set pointer to end of white dial scale. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chassis.

Use a small fiber screwdriver for adjusting both AM & FM IF transformers. Do not press hard on this screwdriver or threads in coil form will strip and alignment will be impossible.

AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD.	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	455KC	AM (Counter-clockwise)	Tuning cap. fully closed	Across voice coil	A1,A2, A3,A4	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A5 for maximum output.
3		"	1400KC	"	Tune for maximum output.	"	A6	Adjust for maximum output.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4	.05 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	10.7MC (Freq. Mod.)	FM (Clockwise)	Tuning control fully clockwise.	Vertical input to Point C. Ground to chassis.	A9,A10 A11	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
5	.05 MFD	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	"	"	"	"	A12,A13	"
6	.05 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	Vertical input to Point B. Ground to chassis.	A7,A8	Alternately adjust A7 for maximum amplitude and straightness of crossover lines and A8 for centering of crossover point on scope horizontal sweep line per Fig. 2. Continue with FM RF Alignment in Step 9.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use a 2 Meg. resistor in series with DC probe of VTVM in steps below. The lead should be shielded.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	.05 MFD	High side to Pin 1 (grid) of 12AU6. Low side to chassis.	10.7MC (Unmodulated)	FM (Clockwise)	Tuning control fully clockwise	DC probe to Point A. Common to chassis	A7	Adjust for maximum deflection.
5	.05 MFD	"	"	"	"	DC probe to Point B. Common to chassis	A8	Adjust for zero deflection.
6	.05 MFD	High side to Pin 1 (grid) of 12BH6 2nd IF Tube (4). Low side to chassis.	"	"	"	DC probe to Point C. Common to chassis	A9	Adjust for maximum deflection.
7	.05 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	"	A10,A11	" " " "
8	.05 MFD	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	"	"	"	"	A12,A13	Adjust for maximum deflection. Continue with FM-RF Alignment in Step 9.

FM RF ALIGNMENT

After adjusting, secure threaded shafts with cement.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9	270Ω carbon res.	High side to FM ant. terminal "F". Low side to chassis.	98MC (Unmodulated)	FM (Clockwise)	98MC	DC probe to Point C. Common to chassis	A14	Adjust for maximum deflection.
10	"	"	"	"	Tune for maximum deflection.	"	A15	Rock tuning control and adjust A15 for maximum output.

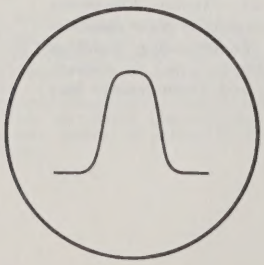

FIG. 1

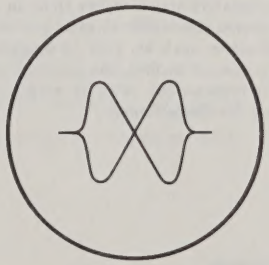

FIG. 2